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Territorialising Colonial Environments:

A Comparison of Colonial Sciences on Land Demarcation in Japanese Taiwan and British Malaya

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Thesis Submitted for the Degree of Doctor of Philosophy

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September 2011

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ABSTRACT

The thesis seeks to establish how far, and in what ways, colonial science articulates a distinctive mode of environmental conceptions and governance. It concerns the entanglement between the government, science, and knowledge. To examine how these combinations may vary it compares how land demarcation progressed in two different imperial territories: Japanese Taiwan (Formosa) and British Malaya. The discussion is based on this pair of case studies of environmental territorialisation, driven by imperial forces, whose legacy is still apparent today. The abrupt nineteenth-century colonial intrusion into these two sparsely populated areas, though occurring in different ways and scales, evoked a similarly dramatic landscape change from the centuries-old indigenous practice of subsistence activities.

There are both similarities and considerable divergences referring to land classification in these two dependencies. In both cases most of the land was delineated as state-controlled forest reserve, which not only enhanced the revenue of government but also supplied the required timber or fuel resources. Another space delimited was aboriginal reservation that sustained the native subsistence or *usufructory* rights at least in part.

By examining the genealogy and material discursive practices of territorialisation as they interacted with local environments and peoples the thesis offers a comparative account of the logics of different empires and the construction of territorial administration. It examines the political ecology of how colonial nature was produced as a resource, with the commodification of forest areas. It unpacks the two cases by studying the role of colonial science, especially cartographic practices, in demarcating and defining territories and peoples. It contrasts the state run surveys in Colonised Formosa with the networks of knowledge production in British Malaya.

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Chapter 1 Introduction

The thesis seeks to establish how far, and in what ways, colonial science articulated a distinctive mode of environmental understanding and governance. The thesis concerns the entanglement between the government, science, and knowledge, in which I compare how land demarcation progressed in two imperial territories: Japanese Taiwan and British Malaya. This pair of case studies reveal practices of environmental territorialisation, driven by imperial forces, whose legacy is still apparent today. The abrupt nineteenth-century colonial intrusion into these two sparsely populated areas, though in different ways and scales, in each case entailed a landscape change that contrasted new imperial production with the centuries-old indigenous practices.

To demonstrate this thesis, my exploration of ‘Territorialising Colonial Environments’ uses a network-based approach whose main body will be divided into three uneven but complementary parts. The first section attempts to develop a conceptual framework which fuses the insights of political ecology and colonial science to explore the way by which colonial states perceived, assessed and divided the nature of their appropriated lands; the second section traces the territorialisation processes through which the two colonial empires structured the dependent socio-cultural environment, namely how they came to know and thence control their newly acquired territory; the final substantive section aims to investigate and to compare the features in these processes of territorialisation in different regions over time. In terms of methodology, source material derives chiefly from extensive work in colonial archives and records. In brief, the process and outcome of land demarcation is not only dependent upon the contestation between groups or politics within collectives, but also based on agency of nature – or more precisely the interpretation of the agency of nature.

RESEARCH QUESTION

‘The *implicit* geography of the native is made *explicit* by geographers;... the fuzzy, approximate and ungrounded *beliefs* of the locals are turned into a precise, certain and justified *knowledge*.’¹

Bruno Latour makes the statement above to highlight the role of geographers of all kinds in translating native geographic knowledge into codified forms. My research rather examines the opposite or return process of those codified knowledge being written back onto the landscape by colonial administrators engaged in processes of ‘territorialisation’.

¹ Bruno Latour, 1987: 216. italics in the original.

Territorialisation is developed as a concept more fully in chapter two but in essence refers to the demarcation and division of land through the application of geographic and scientific techniques.

The central issue for this thesis revolves around how broadly similar environments in separate colonial territories were framed into different patterns by the imperial will operationalised through scientific-environmental knowledge. This thesis focuses upon how such landscapes came to be knowable, were made governable and exploitable. It thus focuses on processes of ‘territorialisation’ whereby state power is written onto the landscape to transform it into territories amenable to the state’s purposes. I unpacks the fundamental imperialising process through which empires acquire lands -- the process of turning another’s land into colonial territories.

Unpacking the way in which colonial rulers intentionally misrepresented the colonised subjects and dominions provides a helpful insight to the *modus operandi* of specific colonial powers. For example, Bernard Cohn, in his study of colonialism to the culture of the colonised, suggests that there is by now a general acknowledgement that British colonial rule in India produced a vast body of knowledge about Indian society (Cohn, 2008: 224-254). Critical historians and social scientists have often pointed to the biases, omissions and interests and motivations behind such portrayals of the colonised society, and their effectivities as an important source material for understanding the administration during that period.

SELECTION OF CASES

One may not imagine that two regions with similar types of broad physical features – tropical climates in the monsoon belt of Asia, with mountainous forested topography in the regional classifications beloved of colonial textbooks - could be transformed into quite different landscapes through the agency of colonialism in just a few decades. The Malay Peninsula and the island of Taiwan exemplify just such cases of rapid transformation. In the late nineteenth century, Peninsular Malaya and the Island of Taiwan became colonies of the British and Japanese empires respectively. In both, the colonial experiences led to dramatic changes for both the land and for the people.

The different territorialisation of the British in Malaya and Japanese in Formosa² produced differing landscapes from the similar physical environments. Although the two

² In this thesis, ‘Taiwan’ and ‘Formosa’ are used interchangeably to denote the island. In most occasions, Taiwan was an official and public term, but in scientific academics, especially for international readers, Formosa was also a preferred name.

colonies shared physical characteristics, such as the monsoon climate and mountainous relief, and both were to play key roles in supplying raw materials into the colonial economies in broadly the same period, the Japanese established state-operated forestry in the central parts of Taiwan's highlands, originally occupied by 'primitive' aboriginals, while private European plantations and mines were facilitated by the British in most of the easily accessible lands in Malaya. They both offer an excellent insight into the process of territorialisation. The logic of zoning was clear and consistent in British Malaya and Japanese Taiwan in terms of the land management or forest governance, although different systems were adopted. Governing by maps, namely surveying and mapping, became the norm for their colonial administration. The colonies of Malaya and Formosa were not found, but created through the application of political, economic and geographic practices that made them into imperial territories. Taiwan, one of the most mountainous island countries in the world, situated in the West Pacific Ocean, was ruled by Japanese governments from 1895 to 1945. Although the coastal plains had long been settled by Chinese populations, before the arrival of north-eastern Asian colonisers, highland Taiwan was the home of Austronesian aborigines who had hunted and shift-cultivated there for generations. Only a few Chinese adventurers had been collecting crude camphor in the borderlands of their domain since the 1860s. However, after the scientific surveying and the introduction of modern colonial governance, the hilly area was transformed swiftly into a district of state-operated forestry (Plate 1-1), and other subsistence and commercial activities were seriously restricted.

Malaya is located on a tropical peninsula at the southern tip of the Euro-Asian continent. Before the British intervention in mid 1870s, the land had been broadly occupied by scattered Malay settlements mostly consisting of kampongs (villages) along the rivers and coasts or in the main valleys. Beginning in the early nineteenth century, Chinese immigrants cultivated small scale cash-crops and mined alluvial tin with some significant concentrations in trading ports and a long term hybrid culture of Peranakans, especially on the straits of Malacca. After the 1890s, the Malay peninsula became increasingly the territory of prominent tin mining and capitalist plantations (Plate 1-2).

The imperial intervention in the economies, or in many ways the creation of imperial economies occurred alongside the colonial-scientific study of environmental processes in both Japanese Taiwan and British Malaya. In both cases the scale of endeavour and intervention really takes off during the late nineteenth century and the first decades of the twentieth century. For the sake of argument, I am prepared here to treat the perception, definition, and demarcation of land and resource, as the outcome of colonial scientific

insight, which came together as a kind of territorialisation. It represents a process in which the colonial state performed power and projected its purposes. Furthermore, the importance of the territorialisation processes lay in how it restructured or reconstituted the relationship between people and land as well as within people.

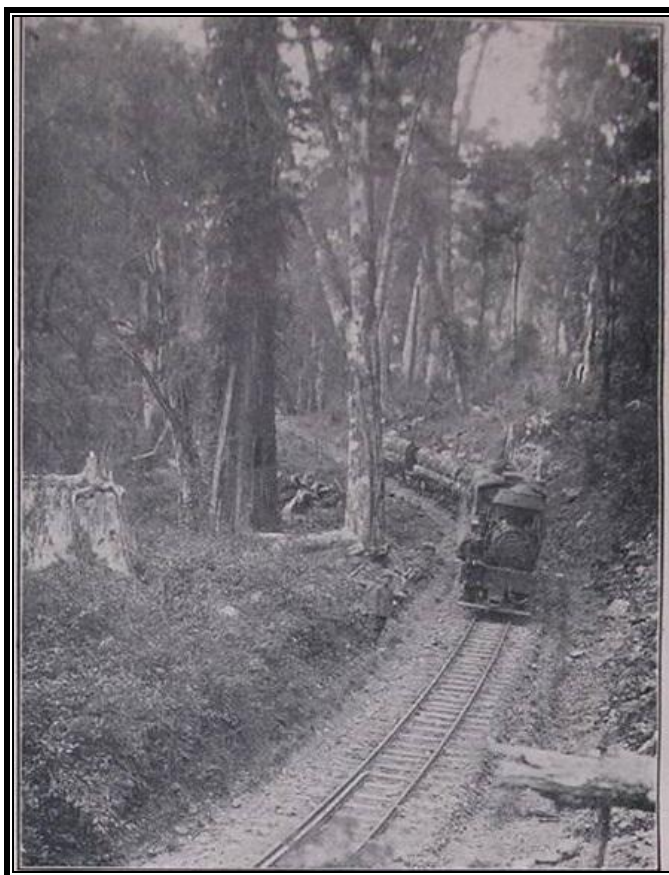


Plate 1-1 Forest and railroad in Mt. *Ari*, Taiwan 1910s



Plate 1-2 Coconut estate, Singapore 1900s

GEOGRAPHICAL CONTEXT, HISTORICAL BACKGROUND AND SOCIAL FRAMEWORK

It is helpful to present the geographical context and historical background before launching a formal discussion of issues. A historic-geographic compound of culture and nature confronted the colonial authorities who were responsible for territorialising tasks. Environmental features implied the wealth or deficiency of nature. Historical experiences determined the technological ensemble of different human groups. Social formations regulated people's access to and exploitation of natural resources. Colonial authorities not only brought new knowledge and imperatives regarding what parts of nature were valuable, but also imported and created new technological ensembles and further redefined access to resources.

Japanese Taiwan: an introduction

Shaped by specific environment and location, Taiwan not only possesses a variety of natural landscapes but also is known for its racial diversity. The island is physically divided into plain, piedmont and highland topography while a warm and rainy climate results in abundant forest growth. By sea passageways, Austronesian aborigines sailed to this island thousands years ago and the immigrants from south-eastern China³, also known as *Han*⁴ Chinese (漢人), arrived in the seventeenth century. By the late nineteenth century, the lower-lying land had been encroached upon and then occupied by the Han Chinese; however the highlands remained the preserve of the aborigines until the Japanese annexation.

A shallow strait, eighty miles wide in the narrowest part, separates the island now called Taiwan from China, and the side of the island facing the mainland is low-lying and relatively flat, while the east coast is lined from north to south by coastal ranges. The Pacific coast, therefore, presents an almost impenetrable barrier and contains no real harbours, while the monsoons, which at certain seasons dash against it, render navigation extremely dangerous. Topographically the island is like Japan in that ridges of lofty, densely-wooded mountains traverse it from north to south and divide it. Westward of the central ridge the land falls in a succession of terraces to a wide plain. In contrast, the middle and east part of the island displayed a quite different landscape. There the land is hilly with narrow valley plains. Climatologically, the proximity of the sea has resulted in the lush vegetation in uplands and a precocious development of agriculture in plains.

³ That is Fukien (福建) and Kwangtung (廣東) provinces of China.

⁴ Local names, such as race, place or individual, are shown as *italics*.

The Chinese government had treated it almost as part of China but a large part of the interior, including, practically all the mountain country, was in the possession of aboriginal tribes. The indigenous population was settled for the most part on the lower terraces or upland valleys. Formosa as it became an object of colonial governance was thus divided between its wild Austronesian aborigines, found on the eastern, mountainous side of the island, and Chinese settlers who cultivate the wide alluvial plain on the western side.

In contemporary accounts and policy documents the Austronesian population of the highlands were termed 番 in Mandarin Chinese, pronounced as *Fan*, and 蕃⁵ in Japanese, pronounced as *Ban*. Those terms translate most directly as ‘savage’, and rather in the way the classical Greek for outsider was ‘barbarian’, imply a lack of civilised values. The terms themselves are thus partly pejorative examples of the *Othring* of these groups – being defined as lacking the qualities of Chinese and Japanese groups. The terms are thus offensive to many of Austronesian descents. Therefore on most occasions in the thesis, ‘*Fan*’ and ‘*Ban*’ have been substituted with the translation ‘aborigine’. However, where the terms are part of the translation of historical documents and historical usage, the word savage has been retained to avoid sanitising the historical material and to show the pejorative view the documents often express. Where this is the case, to show the direct usage and the problematic, the word is quoted in inverted commas.

It is very important to retain the literal translations ‘savage’ since its jarring effect on modern ears highlights how cultural condescension to Taiwanese aborigines seeped into the ruling authorities’ rationale. The quotation serves to show just how widely used the term was in every notification/regulation/law. The term was at the time unremarkable which indicates how moral judgements freighted policies. The term reveals a cultural hierarchy where lack of economic development also meant a lack of social and moral development. The latter implying the aborigines were dangerous, untrustworthy and incapable of negotiating as equals.

Scholars, such as Emma Teng suggest that categorising the Taiwan aborigines as ‘savage’ was at odds with both the official Qing Chinese government’s imperial ideology and its rhetoric of privation (Teng, 2004). And yet during the Qing dynasty, the term ‘savage’ was habitually used in Taiwan. As late as the second quarter of the 19th century, a three-tiered ethnic-classification with specific geographical distribution was developed. According to Chhuan-An Teng’s (鄧傳安) *Outline of Taiwan ‘Savage’ Tribes* (臺灣番社紀略),

⁵ In Japanese Taiwan, the aborigines were also sometimes referred to as 生蕃 *Seiban* or 蕃人 *Banjin*.

She (社) is where the savages settle and delimited with another She. Shou-fan (熟番) lives in plains or hills inside the borderline while Shen-fan (生番) lives outside the borderline' (Teng, 1958: 1).⁶

Therefore, the ethno-map of Formosa in the Qing reign may be presented as follows: the north and west of the island comprising lowlands, tablelands, and lower hills are chiefly inhabited by *Han* Chinese. The aboriginal groups who occupied the centre of the island but were out of Qing authority are *Shen-fan*⁷ or *Chhe-hwan* in Fukien dialect of Chinese language. Finally there were the *Shou-fan*⁸, also known as the *Pepohoan* (*Pei-po-hwan*, 平埔番), *Sek-hwan* (熟番), or *Sekhuan* (熟番), their villages scattered in the plains or lower hills and always intermediated between the *Han* Chinese and *Shen-fan*.

Politics in forest management

The establishment of a 'Forest Management District' (事業區, hereafter FMD) can partly demonstrate the way in which the Japanese Empire viewed its first and southernmost colony, Taiwan. By the end of the Japanese-ruled period, the authority had delineated a group of more than thirty 'FMD' around the island (Figure 1-1). The configuration and demarcation of forestry units was rationalised as being based on watersheds or river basins and typically followed the procedure below. At the start of making plans, forestry authorities had to take into account technical issues, including the distribution of forests, the extent of exploiting forest produce and conditions of transportation. Then they subdivided some appropriate areas for practising forestry. Last, the drafts of the plan dividing up the forest had to be passed to the local governments, Police Bureau, the state Monopoly Bureau, which as we shall controlled resource exploitation, and so on for reviewing before implementation.

British Malaya: an introduction

A series of economic, political, and social changes in Malay Peninsula followed the nineteenth-century British intervention which was especially interested in its natural wealth and strategic location. The small and politically complex peninsular of Malaya had an importance out of all relation to its size. Patterns of imperial trade meant it had a

⁶ The article collected in the book '*Li-chhe-hui-chhao*' (蠡測彙鈔, *Chhuan-An Teng's Collections*) was originally published in circa 1830 and was reproduced in 1958.

⁷ Some Westerners call them 'wild savage' which apparently follow the conventional Chinese calling. See Acting Assistant Consul Bullock's *Report of a Journey into the Interior of Formosa*, 1873: 395.

⁸ Acting-Consul Hewlett, for example, termed *Shou-fan* as the 'civilised aborigine' in his *Report on the Trade of the Port of Taiwan, for the Year 1870*, p298.

commanding position on the most frequented route way between the Indian Ocean and the south-west Pacific, and its political economic incorporation into the British empire both resulted from and led to its production of rubber and tin, vital commodities for both peace and war, eventually approximately 22 per cent and 29 per cent of the world's supplies respectively.

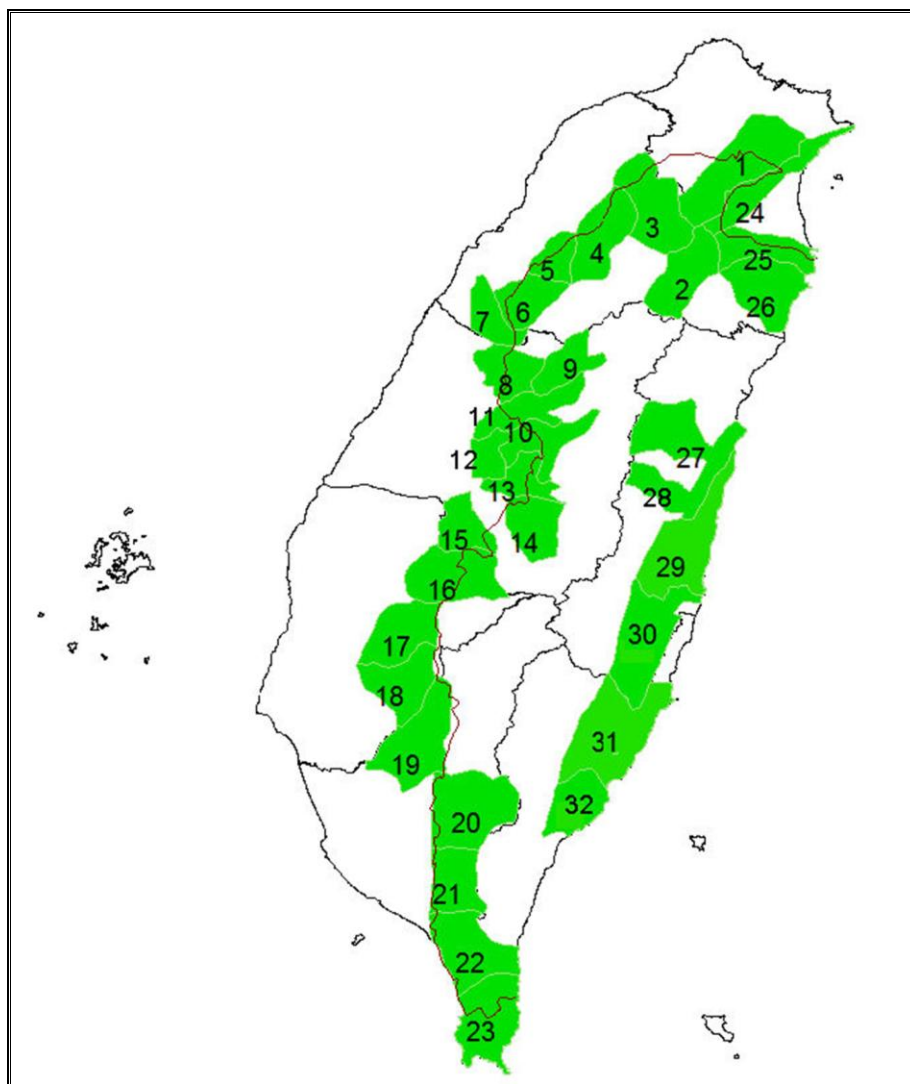


Figure 1-1 Forest Management Districts in Japanese Taiwan

Nature, society and history

The Malay Peninsula, also called the Kra Peninsula, in Southeast Asia, is a long, narrow appendix of the mainland extending south for a distance of about 700 miles (1,127 km) through the Isthmus of Kra to Cape Balai, southernmost point of the Asian continent; its maximum width is 200 miles (322 km). Its central mountain range, rising to 7,175 feet (2,187 m) at Mount Tahan, divides the peninsula. The western coast is exposed to the southwest monsoons and the eastern coast to the northeast monsoons. Most of the western

rivers have comparatively short courses, and navigation is limited by extensive silting near the sea.

Forests had grown up in the sedimentary coastal plains of that accumulated from bountiful creeks, rivers known as *sungeis*⁹. Most of the rivers on the west side of Malaya carry a large amount of sediment, and any interference with the free movement of the water results in its liberal deposition. All along the seaboard of the peninsula the inshore waters silt up rapidly. Their shallowness, low salinity and sheltered position encourage the development of stands, and later forests, such as mangroves. As the forest matures, it in itself increases the rate of sedimentation still further, and as the mud spreads and thickens among the clustered roots, the nominal coast line moves slowly seawards.¹⁰

Tin mining on a large scale was introduced by and resulted in the large numbers of Chinese immigrants and altered social and political conditions in specific mining areas. Much more dramatic changes were brought by the British. By the early 19th century the Chinese had begun settling in large numbers in the sultanates along the peninsula's west coast, especially Perak, Selangor, and Sungei Ujong, where they cooperated with local Malay rulers to mine tin. The Chinese and Malays increasingly became entrenched in an inadequately integrated socio-political structure that continually generated friction between the two communities. British investors were soon attracted to Malaya's potential mineral wealth, but they were concerned about the political unrest. As a result, by the 1870s local British officials began to intervene in the internal affairs of various Malayan sultanates—establishing political influence (sometimes by force or the threat of force) through a system of British residents (advisers). Under the guise of acting as a neutral 'umpire' between conflicting races, the British took control of the territories. Initial intervention was often crude and incompetent and rapidly had to be systematised. The anodyne sounding system of '*Residents*' became the peaceful means obtaining absolute control of the most of Malay Peninsula south of Burma and Siam.

With the opening in 1869 of the Suez Canal, which provided a dramatically shorter maritime route between Europe and Southeast Asia, the full effect of European technological development swept over the region. Classic accounts portray this as the gradual absorption of Malaya into the world system. These however are not merely histories of colonisation but also 'colonial' in the sense that they portray the British as the principal actors in the period, the initiators of action. The development and execution of

⁹ *Sungei* means river in Malay language.

¹⁰ Cited straight from M. E. Wayte, 1959, Port Weld, *Journal of the Malayan Branch of the Royal Asiatic Society*, 32(1): 154-167.

British policy are the main concerns of this kind of history.

This conventional, and still colonial, 'British Malayan' story commences with the establishment of British power in the Malay sultanates. Beginning in the 1870s, the various Malay rulers were encouraged or compelled to accept British advisers, or Residents, at their courts. These Residents quickly became the real rulers of the Malay states. British-run bureaucracies were developed along with communications and financial structures and, in 1895, the administration of four of the states was centralised in Kuala Lumpur. The Sultans were retained in the new polity, the Federated Malay States (FMS), but essentially as ceremonial figureheads. They continued to possess certain powers in matters concerning Malay religion and custom but the real administration of the country was in British hands.

By the mid 1910s, Britain had now achieved formal or informal colonial control over nine sultanates, but it pledged not to interfere in matters of religion, customs, or the symbolic political role of the sultans. The various states kept their separate identities but were increasingly integrated to form a unified political-economic entity of British Malaya. Economic and political conditions all along the west coast were much the same. In terms of an administrative system, every State was divided into Districts, and in each District there were one or more European magistrates, and usually one or two Malay magistrates with limited jurisdiction. The Districts were again sub-divided into *Mukim* and with their own Malay head-men, called *Penghulu*.

Politics in land administration

The constantly changing political and administration systems of British Malaya provide a fertile area for network based research. In 1874 the governor of Straits Settlements, Sir Andrew Clarke, concluded the first treaty with a Malay sultan which transferred power to the British government. This marked the beginning of the expansion of colonialism in Peninsular Malaya, which concluded in 1914 when the Sultan of Johore finally agreed to a similar agreement with the British (Warnk, 2001: 181). After this date, one British Resident was established in each state of the Federated Malay States of Perak, Selangor, Negri Sembilan, and Pahang, with one Advisor in each of the Unfederated Malay States of Johore, Kedah, Perlis, Kelantan and Trengganu. The individual local administrations of Native Malay States had the latitude to make whatever arrangements they thought best suited the local conditions to increase the output of key commodities. Some states promoted the plantation industry by reducing premium or rent, others achieved a similar goal by increasing imported labour (Drabble, 1973: 14-19).

The tale that Fook Seng Loh (1969: 109-113) tells is one example of political contest

and change in British Malaya over land administration formation. It was normal to have several land systems at the same time in the Peninsula, because each provincial government had its own jurisdiction. In addition, the links and conflicts between individuals often had impacts on who adopted which measures and where. One of the factors this thesis will track then are the networks and circulations of information, beliefs and influence between often small groups of key actors. To illustrate this one can take the case of plantation concessions. Initially, different land tenures were operated in Perak and Selangor, the former one was put into practice under its first Resident Hugh Low, who was assisted by William Maxwell, whilst the latter originated from Douglas' Residency when Dominick Daniel Daly took charge of Public Works Department for him. However, when Frank A. Swettenham stepped into the resident post in Selangor, he rejected the previous system established by Low and chose to import the Perak one to Selangor (Loh, 1969: 116-117) as well as later to other Native States, comprising Sungei Ujong, Jelebu and Negri Sembilan (Loh, 1969: 129-130). Moreover, Loh implies that the position of the European land grant concessionaire, often a friend of the Resident, played a weighty role in the mosaic of land administration (Loh, 1969: 118-119). The colonial administration was a regulator, or perhaps better, enabler, whilst the grant concessionaire was the actual property developer.

A graphic embodiment of these personal, knowledgeable networks of colonial governance in a small and new colony is provided by an interesting photo (Plate 1-3), taken outside Government House, Singapore in about June, 1886, which shows the literal shape of politics in British Malaya in the late nineteenth century. The seated British gentlemen, from left to right, were F. A. Swettenham, Sir Frederick Weld, Mr. Hugh Low and Mr. J. P. Rodger. Those standing were Mr. Hugh Clifford, Gerard Wallop (private Secretary to Sir F. Weld), Hon. Martin Lister, William Maxwell. Amongst them, Maxwell was appointed as a Land Commissioner in 1882, and the following year was sent to Australia to study the Torrens land system, which became the paradigm of land administration imposed in Malaya later (Loh, 1969: 109-110); Clifford was posted as Resident from 1874 to 1896 and was regarded one of the important figures in fashioning the Residence System; Swettenham was one of the most experienced civil servants since he had stepped into the Straits Settlement government aged twenty.

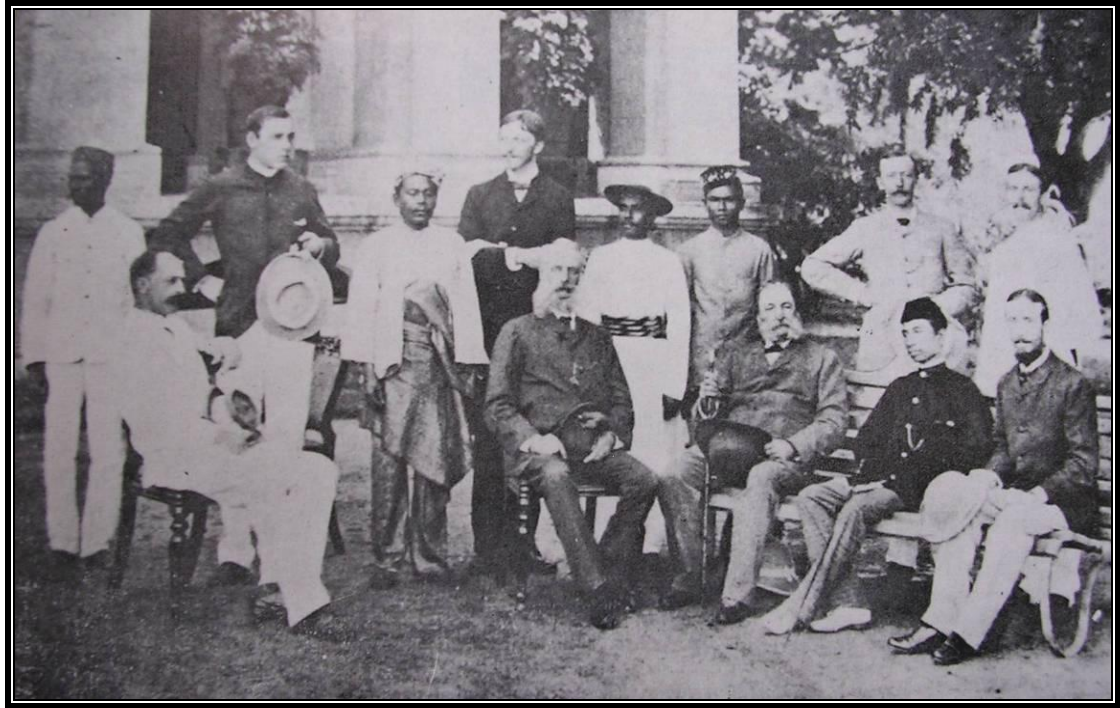


Plate1-3 Big men in early colonial Malaya

Source: Wicks, 1979, plate2

AIMS AND OBJECTIVES

The key theme of the thesis will focus around how the colonial empires viewed or treated their ruled land and people in the context of how the perceptions affected the formation of colonial science, with special reference to land administration. The crux of the thesis is unpacking the logics of territorialisation. By adopting such an historical and site-specific view of the transformation of land control and access, several broader themes regarding the relationship between government, science, and knowledge are brought into focus. Such as how did the Japanese in the late nineteenth century deal with the exotic encounters, such as cultural and institutional ones, that occurred on Taiwan? Was it the same case with the British in Peninsular Malaya, with their wider and longer imperial experience? Were the networks of key players and institutions comparable? How did knowledge and crucially practices that created that knowledge, move through the colonial administrative system?

On the basis of cultural backgrounds, political contests and economic considerations, the colonisers perceived, defined and demarcated their land, with special reference to 'Unoccupied' areas, and people. In brief, in processing the 'territorialisation' research, three specific objectives would be included as follows.

- 1) To explore the way by which the British and Japanese empires perceived, understood and imagined the nature of their appropriated lands.
- 2) To examine the processes through which they constructed socio-cultural

environments (i.e. territory).

- 3) To investigate how the nature of Japanese/British imperialism was inflected by their colonial sciences for 'improving' their possessions.

CONCEPT

The research is most interested in by what techniques the colonial state could achieve the effective governance as well as how they worked for that result. The classic work, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, by Benedict Anderson makes the point about three institutions of power, that is the census, the map, and the museum. Anderson claims that the institutions, although invented before the mid-nineteenth century, changed their form and function as the colonised zones entered the age of mechanical reproduction. Anderson suggests that together they profoundly shaped the way in which the colonial state imagined its dominion - the nature of the human beings it ruled, the geography of its domain, and the legitimacy of its ancestry (Anderson, 1991: 163-164). In the forming of this imaginary, the census's abstract quantification/serialisation of persons, the map's eventual rationalisation/codification of political space, and the museum's 'ecumenical,' profane genealogising made interlinked contributions (Anderson, 1991: 163-186).

In addition, the thesis' argument critiques the efforts of colonial statecraft on territorialisation drawing inspiration from James C. Scott's fine analysis in his *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Scott claims that states attempt to make society legible, to arrange the population in ways that simplified the classic state functions of taxation, conscription, and prevention of rebellion. He also suggests that whatever their purposes, the designs of specific systems all seemed calculated to make the terrain, its products, and its workforce more legible - and hence manipulable- from the centre (Scott, 1998: 2).

There were several ways in which scientific discourse allowed the colonial domination of nature to extend the power of the coloniser over the colonised. The measures worked to produce a new knowledge on land. Bruce Braun, for example, considers the mapping and interpreting of the geology of Canada. In the eighteenth century, European explorers had noticed the morphological particularities of the coast of the Pacific North West, but these were represented as individual profiles or idiosyncratic sites. It was the achievement of nineteenth century geology to read them instead as signs standing for a larger structural order. Braun remarks that in the span of less than 100 years a dramatic shift had occurred, from collecting specimens and viewing the physical outlines of landscapes, to 'seeing

geologically'. What was visible in nature had changed irrevocably: one no longer attended to scattered mineral samples or other curiosities, but to the 'inner architecture' of the earth (Braun, 2000: 22). Other ways such as the vision of rivers altered as well as colonisers learnt to see hydrologically. In the second half of the nineteenth century a new discourse of hydrology and hydraulic engineering emerged which translated 'nature' into mathematical formulae (Gilmartin, 1995). For the authorities the classification of colonial things was an important and instrumental means to effective governance.

Science made many of the discursive moves in colonial governance. In the course of colonial exploration and administration, the maps, sketches, and illustrations were folded into the projects of knowledge formation. Local practices were dis-placed in order to be re-placed within a taxonomy. Cartography, one of the critical methods, made visible a colonial 'order of things' by means of a thoroughgoing spatialisation of knowledge that brought various sustaining and commercial ways of living within the sovereign grid of government scientific rule. Cartography is a special way of looking at the world and the cartographical representation was much more demonstrative than the mere literal and pictorial records.

A variety of territorialising measures were adopted to implement higher policies and strategies. For example, for the purpose rationalising the land utilisation in highland Taiwan, the colonial authorities had chosen to put same land uses closer spatially. Grouping and clustering thus became a chief approach for the Japanese administrators to enact the proposed territorialisation process in highland Taiwan.

Not only the possible aboriginal reserve but also the potential forested land was to be clustered through a cartographic vision that ordered activities, and people, into places. On the one hand, the aboriginal population was expected to occupy the lower-hilly parts of mountains. The aboriginal reserves were created in selected localities by removing aborigines from their ancestral land and depriving them of access to lands and resources. These people were told to learn sedentary agriculture too, such as paddy cultivation, stock herding and sericulture. By doing so, they would not invade valuable forests and were not harmful to the exploitation of natural resources. On the other hand, the potential forests which were originally occupied by the native aborigines would be recovered. Both of these two situations above are involved with aborigine relocation and involved purifying actual landscapes to correspond to scientific categories of ideal land use.

Territorial formation and cartography

Territories are both formatted through state-formation and help form those states.

Modern states need to know the objects and lands they claim before truly governing them, although these mastering states may do so in different ways under separate logics. What the governors would encounter might be the quantity and quality of the ruled population or the spatial extent of land and environmental contents there. In terms of population, registration systems may be adopted and anthropological experts might be despatched to ensure their demographic correctness, or indeed to develop categories of enumeration and division. As for land, cartographic techniques would be applied and scientific knowledge could be employed to understand geographical features. After the exploratory stage, the authorities start to consider issues about the classification of people and the demarcation of land. These sort of dividing practices not only facilitated the successful management of administered objects, but also create an image or vision beyond the objects themselves. These official actions are usually parts of state-formation processes – bringing disparate local entities together, such as the Malay sultanates, into a new colonial entity. After the government's engagement, therefore, what we would see are whole new nations with their produced nature and constructed imagination.

The (re)classification of land and people occurred almost in parallel in colonial territories. In a similar logic but a different fashion, imperial powers had undertaken both the perceiving and classifying processes in their colonies respectively. The difference between the *formal states* and *colonial territories* lies mainly in the types of politics in terms of government. The politics within the colonies implied a considerable dominance referring to the coloniser over the colonised. As a result, the powerful coloniser determined what the colonised people should be and what the ruled land should look like. The colonial state not only approached but also further constructed the knowledge about the colonial populations and territories. In the processes of colonial classification, science played a unique and dual role.

However, regrettably the geography of such things has been seriously undervalued in assessments of the colonial classification. There is a voluminous literature on the subject of the classification of peoples during the colonial period, covering most aspects of the ruling and the ruled races, class, and gender in generalised terms, but there has been comparatively little written about the land demarcation or environmental territorialisation within the empire's sphere of power. To remedy this, at least in part, this research is concerned how environments were learned differently in the colonial context. The author here suggests that the environmental territorialisation did not just involve an assertion of colonial government sovereignty but also concerned the interpretation and representation of physical geography that most of the humanistic and social scientists have ignored.

Framing or Construction?

These practices of state governance all depend on specific modes of knowledge formation. Two broad interpretative schools, those of construction and framing knowledge, dominate analysis of developing colonial discourses, enacting management laws, or organising department offices. The former suggests that knowledge depends in the last instance on the knower, or beholder, and latter suggests that whilst knowledge is selective, it is in the last instance only a version of what is there. However, whilst discussing the issues relating to territorialisation in later chapters, my research does not attempt to depict an abrupt difference between these final implications of the two approaches, rather it sees both as in practice involving similar analytic steps. In both case studies, Japanese Taiwan and British Malaya, in my study, in fact, knowledge formation is usually involved with the power relations, whether in the sense of construction or framing. The debates and origins from the Foucauldian notions, of governmentality (hence power/ knowledge) of these approaches are developed further in chapter 2.

‘Framing’ and ‘Construction’ are going to become the main analytical approaches of my thesis. On the one hand, the notion of ‘framing’ is inspired by Charles Rosenberg (see for instance Rosenberg and Golden, 1992), originally in the context of disease and colonial medicine. Although I do not fully concur with his contention that ‘in some ways disease does not exist until we have agreed that it does’ (1992: 326), I agree that only after perceiving and naming its occurrence, that people are able to respond to it, and such perceiving and naming shape that response. This thesis finds that, in most cases, the framing perspective unravels the dramatised complex in which the variety of actors perform. However, we have to admit that it is true too that on particular occasions specific system or discourse can be constructed intentionally in complete ignorance of extant situations. Meanwhile, the constructivist approach often reveals, but sometimes overplays, the one sided nature of power relations.

In terms of the formation of colonial knowledge, both the notions of ‘*Construction*’ and the ‘*Framing*’ are adopted, combined, and proposed to be the chief analytical structure through the whole research. In both British Malaya and Japanese Taiwan, the colonial authorities developed a hybrid of land definition ideologies and practices. They produced fresh categories *ex novo*, but more often they imported or adapted others, often transplanted from their metropolis or the older colonies, and equally reframed the existing and domestic components into an innovative mode of governance.

Most of the land categories were formed through framing extant land utilisation

practices, while the notion of forest reserve was transplanted from outside the region. Some concepts about the reserves are clear transplants. The British introduced the notion of Forest Reserve into the Malay States from the Indian Raj at the end of nineteenth century while the Japanese modelled the aboriginal reserve in Taiwanese highlands in the first quarter of twentieth century, on the experiences of aboriginal administration in Hokkaido, one of the four main islands of Japan. It is worth noting that in the name of forest conservancy and economic benefits, which together constituted the formative factors in scientific forestry, large areas of forested land in both Taiwan and Malaya were preserved or reserved, that is to lay out Forest Reserve, sooner or later. The issue to explain is how and why out the empirical diversity of land items and topographic units were framed into such a simplified classification framework.

Situation of research

This study is significant in terms of generating knowledge about colonised environments, or more exactly about how knowledge about colonised environments was generated and deployed to reshape the landscape. Colonised environments are the normal inheritance of most modern Asian states, as colonial experience is always one of significant factors for their individual histories. In this context, contemporary so-called environmental knowledge is still often in the shadow of colonial forms. In other words, what the colonial administrators had shown to the colonised natives, even their peers in the metropolis, is still effective currently in land classifications, administrations and categorisations. The ideas of valued land and potential resource were not only accepted thoroughly during the colonial period but also were subsequently embedded into the minds and institutions of colonised and post-colonial peoples.

Bridging Japanese Taiwan and British Malaya

This research is an ambitious attempt to bridge the different national traditions in Taiwan and the United Kingdom. It is undertaken partly as a corrective to, first, the tendency of colonial histories to focus upon singular state formations and, second, for current post-colonial historiographies to be written through singular empires – usually by descendants of colonisers or colonised. By choosing the difficult comparative route this thesis hopes to throw into relief the contingencies, framings and constructions of comparable environments exposed to different colonial regimens. Things to note about the differences of colonial states as well as affiliated colonies are: First, Japan was the only non-Western colonial power before World War II. Was Japanese colonialism any different

from its Western contemporaries? How similar was the Japanese administration of Taiwan to French, Dutch, British, or American rule in other parts of Asia? Second, how closely did the pattern of governmental initiative established by the British experienced administrators parallel that of Japanese novice officers and how influenced were both by their different experiences in their home islands? Formal territorialisation which was undertaken by surveying and mapping was a key tool of the modern nation builders. How important was territorial work in Japanese Taiwan and British Malaya as an instrument of the colonialism? This thesis is specifically addressed to those questions.

There are historical precedents to comparing the colonial administrations of the Japanese and British dependencies. Efforts to examine the similarities and differences between the British and Japanese Empires find their pioneer origins as early as in the colonial period itself as part of the reflexive process of governance. Contemporary commentators, usually colonial officers or imperial intellectuals, tended to focus on what policies from another imperial power could probably be beneficial to their own empires. Yosaburo Takekoshi may be one of the earliest comparative observers ever known. As an enthusiastic pioneer of Japanese colonialism, who had personal but brief experience in Taiwan during its first decade of Japanese administration, the English edition of Takekoshi's *Japanese Rule in Formosa* was one of most popular accounts known to Western intellectuals. He made several comparisons in the said book and expressed a strong admiration for the British and their methods – which may have aided its reception among British colonial elites. For example, Takekoshi suggested putting the less-known parts of the island Formosa in the hands of one or more chartered companies, just like the British North Borneo Company established in 1881 (Takekoshi, 1907). This suggestion was obviously inspired by the British style of rule in west-northern part of Borneo island. In this case then we not only have contemporary comparisons but also traffic between the modes of governance through networks circulating ideas.

Interestingly, more than one decade later, for example, Sir Charles Eliot, a British Ambassador stationed in Tokyo, Japan, gave the following remarks after his official visit to the island of Taiwan in the early 1920s:

Formosa is interesting chiefly as an example of Japanese colonial methods, and I think, may be fairly compared with our East African possessions. Both were acquired at about the same time; both are tropical countries with considerable vegetable riches; in both the interior is inhabited by warlike savages; and in both there was an anterior, but not very efficient, foreign Administration on the coast- Arab in East Africa and Chinese in Formosa; in both this foreign element rebelled unsuccessfully in the years

following the establishment of British and Japanese rule (Eliot, 1921: 327).

Eliot paid closer attention to the difference of the two empire's colonial methods, because he felt so many similarities among them, whether in the ruling duration or the potential forest wealth. However, it is a pity that the British officer did not provide more detail on this issue. Therefore, we are not fortunate enough to find any comments specifically on issues such as the aboriginal governance and forest management.

Finally, in attending to the particularities, contingencies and differences of colonial governance practices established, the research can partly be seen as an actualisation of Nicholas Thomas's (1994) invitation to explode the fiction of singular 'colonialism' into diverse local practices that need to be investigated through their singularity, rather than an appeal to an archetypal monstrous practice.

FRAMEWORK, METHOD, AND SOURCES

Thesis Framework

Various chapters to this thesis address the impact of benefits, interests, and projections involved in territorialisation – the inscription of colonial state rule on the land. The chapters are arranged in the following pattern:

Chapter 1 has provided a brief introduction setting out the environmental, historical, and economic background of the would-be discussion colonial territories, namely British Malaya and Japanese Taiwan.

Chapter 2 attempts to search for the meaningful framework and proper methods to approach this thesis. Basically, there are two tiers of theoretical development and assessment. The thesis essentially looks at the entanglement between the government, science, and knowledge. The chapter firstly concerns about the formation of environmental knowledge within the colonial context, then focuses on how did this knowledge foster colonial management of environment. The environmental knowledge was obviously made in the circumstances of politically-dominated regions. Accordingly, the chapter introduces the more hierarchical conception of power relations animating Political Ecology approaches to explore the shaping of aforesaid knowledge. Following that, it works on the way by which the colonial authorities made good use of the knowledge to demarcate and to form spatially-governed units. The different ways of thinking and practising resulted in diverse types of Colonial Science. Political Ecology stresses the political forces and economic benefits that structure ecological and landscape change, but at the same time it often downplays the relevant mechanism. Therefore, I shall also work on the mechanism by considering some crucial actors' or decision-makers' networks.

The heart of the thesis, is four chapters 3, 4, 5, 6, that form an extended exercise of comparative analysis, where Japanese Formosa and British Malaya are each analysed through early and mature phases of territorial organisation, tracking practices of knowledge generation and imposition. The breadth of this kind of treatment yields an understanding of the land definition and demarcation development of peninsular Malaya and island of Formosa since the intervention and participation of colonial powers. In addition, each chapter focuses on specific and critical maps and draws out a wealth of illustrations.

Chapter 7 is a rigorous comparative analysis of the colonial governmentality reflected in exploratory activities and land/forest demarcation in British Malaya and Japanese Taiwan respectively.

I conclude that through the territorialisation processes, the Japanese and British powers not only claimed successfully their possessions in the colonies of highland Taiwan and the Malay Peninsula respectively, but also governed systematically the environment and people there. The territorialisation processes began with the varied forms of land control or involvement, such as forced occupation in Taiwan and peaceful negotiation in Malaya, and ended with the establishment of a comprehensive land administration, inclusive of creating offices and enacting laws.

I also suggest that the complex web of environmental factors were abstracted or distilled into a few simplified categories for the needs of control and exploitation. By so doing, the land and resources were rendered cartographically intelligible, administratively governable, and/or commodifiable. On the one hand, in British Malaya, the land alienation and settlement meant the guarantee of land revenue. On the other hand, in Japanese Taiwan the forest subdivision implied the potential rationalisation of forestry management. In terms of land classification in aggregate, however, there were amazing similarities between Japanese Taiwan and British Malaya. The divisions formatted by both of the authorities could conceptually be merged into three categories- state (reserved) forest, private industrial land and aboriginal reservation. Even though there were differences of initiative, status and importance, the land administration framework expressed a seemingly consistent logic for both of colonial governments imagined their annexed territories. As for exercising territorialisation, the colonial administrators of the two states displayed diverse governance behaviours. The British imperialists had tended to craft specific rules and regulations for individual land utilisation patterns, while the Japanese authorities preferred to mobilise their staff to instruct or direct the colonised subjects to create designed status and localities.

Archive Research

This land demarcation research on the practices of colonial science was conducted by archival searching and analysis. Although the underlying rationales and motives behind land definition and demarcation are not directly documented in the official publications about the process, we can still reconstruct them through mining government files and archives as well as reading important figures' papers, such as their personal diaries, journals and autobiographies.

Much of the scholarly consideration of colonial science and environmental knowledge has generally focused on the more recent historic period, a period for which scientific and bureaucratic source material is more readily available and in which the role of the state and colonial scientific and technical services is more clearly evident. This research is not an exception, but the author has profited from his use of three languages in his research, i.e. English, Japanese and Chinese. This is not a pioneer research finding new colonial archives held in the metropolis or former colonies, which is how some scholars have completed their masterpieces. Nor is it easy, to seek exactly parallel files and compile corresponding catalogues of Japanese Taiwan materials with British Malayan counterparts, since there are considerable governmental structural differences between offices and departments, and differences in practice.

At least three chief categories of materials relating to Japanese Taiwan and British Malaya during colonial period will be used in the thesis: official records and publications, personal papers, and journals or newspapers.

1. Official records and archives existed for both colonies, such as government archives, land (re)application documents, and actual Forest Management Plans, These could be supplemented with official publications, such as reports, which were often a source of ideas about rationales and intentions, and gazettes, the latter tending to be spartan in context but offer formal factual records of acts and decisions rather than rationales.

2. Personal papers of key colonial officials were mined to explore the intention and design the colonial state had imposed on to its territory.

3. On the other hand, historical public publications, such as newspapers, travel writings, and professional journals of some societies, will be examined to portray societal-environmental backgrounds that time and to recognise the problems colonial authorities encountered.

Source Materials

To gather appropriate and abundant materials for research, several institutions of different countries were my fieldwork sites. According to metropolitan-colonial relations, various types of files and documents are held by separate Archives or Public Record Offices. On the one hand, British Malaya relevant records are stored in United Kingdom, Malaysia and Singapore respectively. Some archives, mainly *Correspondences* and *Despatches*, originally owned by the Colonial Office are now held in the National Archives, Kew, London (formerly the Public Records Office). Whilst the later official papers are still chiefly collected by local government in Arkib Negara Malaysia (National Archives Malaysia) which are located in the colonial centre of Malaya, Kuala Lumpur. Within these documents, the purposes of some records such as the *Government Gazette*, routine reports (i.e. *Annual Reports*) and so on, were to display the development of British colonial administration. In addition, the most important of the maps to my research are (Revenue) Survey Maps compiled and drawn at the (Revenue) Survey Office dated from the late nineteenth century to mid twentieth century. Although not complete, it is possibly to outline the distribution of leases and concessions, such as agricultural plantation, mining district, forest reserve, and Malay Reservation, in some Native Malay States under the British rule.

On the other hand, archives relating to Japanese Taiwan are collected in Japan and Taiwan. However, only Taiwan-based files are utilised in this research, which cover most of the original archives belonging to colonial period. Three main archives collections in Taiwan are Taiwan Historica (TH) which is situated in Nantou, central Taiwan; the National Taiwan Library (NTL), Taipei; and the National Taiwan University Library (NTUL), Taipei. Essentially, the TH is the primary archive holding most key collections, such as the *Archives of Formosa Government* (臺灣總督府公文類纂, Taiwan Sotokufu Koubunreizan)¹¹; some of them, including the *Forest Management Plan* (森林施業案, FMP) and related cartographical maps are stored in the Forestry Bureau, Taipei. Recently the FMP began to be open to the public, but has not often been used by academics thus far; some documents are collected by NTUL. Apart from these, published official publications, such as *Annual Reports*, *Bulletins*, *District Gazettes*, *Transactions*, are chiefly held in the NTL.

¹¹ All minute, correspondence, enclosure, memorandum and notice are categorised by annual series as well as departmental sub-series.

Table 1-1 Archives, Reports, and Series Held in Different Locations

Taiwan		
Archives	Formosa Government Archives (FGA)	Taiwan Historica, Nantou
	Forest Management Plan (森林施業案)	Taiwan Historical Institute, Taipei
Official reports	Annual Report for Aboriginal Industrial Instruction (高砂族授產年報)	the National Taiwan Library (NTL), Taipei
	Annual Report for Taiwan Industries (臺灣產業年報)	NTL, Taipei
	Formosan Government Civil List (臺灣總督府文官職員錄)	NTL, Taipei
	Report for Aboriginal Races (高砂族調查書)	NTL, Taipei
	Report for Taiwan Forestry (臺灣林業ノ基本調査書)	NTL, Taipei
	Report of Oil Field Prospecting in Taiwan (臺灣油田調查報告)	NTL, Taipei
	Report of the Board of Production (殖產部報文)	NTL, Taipei
	Series of Reports for the Tropical Industries Survey (熱帶產業調查會調查書)	NTL, Taipei
	The Draft for Taiwan Historic Materials (臺灣史料稿本)	NTL, Taipei
Series	Journal of the Straits Branch of the Royal Asiatic Society	National Taiwan University Library (NTUL), Taipei
	Taiwan Hydraulics (臺灣の水利)	NTUL, Taipei
	Taiwan Times (臺灣時報)	NTL, Taipei
	The Formosan Agricultural Review (臺灣農事報)	NTUL, Taipei
	The Journal of Geography (地學雜誌)	NTUL, Taipei
	Transactions of Colonial Society (殖民協會報告)	Taiwan Historical Institute, Taipei
	Transactions of Japanese Forester Association (大日本山林會報)	NTUL, Taipei
	Transactions of Taiwan Forester Association (臺灣山林會報)	NTUL, Taipei
	Transactions of Taiwanese Miners Association (臺灣鑛業會報)	NTUL, Taipei
United Kingdom		
Archives	Colonial Office (CO) 273- Straits Settlements Despatches to Secretary of State	National Archives, Kew, London
	CO700/ STRAITS SETTLEMENTS 23 CO700/ STRAITS SETTLEMENTS 36	National Archives, Kew, London
Official reports	Perak Government Gazette	National Archives, Kew, London
	Selangor Government Gazette	National Archives, Kew, London
Maps	Revenue Survey Maps	National Archives, Kew, London
Series	Journal of the Straits Branch of the Royal Asiatic Society	Durham University, Durham
Malaysia		
Archives	Secretariat Selangor 3719, 1915 Secretariat Selangor 3635, 1916	Arkib Negara Malaysia (Malaysia National Archives), Kuala Lumpur
Series	Selangor Journal	Arkib Negara Malaysia (Malaysia National Archives), Kuala Lumpur

Chapter 2 Theoretical Development and Assessment- Government, Science and Knowledge

INTRODUCTION

My research exploring the territorialisation of colonised environments is essentially an attempt to look at the entanglement between the government, science, and knowledge. It is firstly concerned with the formation of environmental knowledge within the colonial context, then focusing on how this knowledge enabled management of the environment. Knowledge formation involves the abstraction and separation of only specific and selected elements or ideas from the real world. Here environmental knowledge was created through the lens of the colonial authorities. This environmental knowledge was made under conditions of political subjugation and domination, with the Malay Peninsula under British rule and the island of Formosa under Japanese administration. Accordingly, the thesis deploys the focus on hierarchical power relations around control of natural resources that animates Political Ecology (PE) approaches. Following that, the thesis works on the way by which the colonial authorities made use of environmental knowledge to demarcate and form spatially-governed units. The different ways of thinking about the environment and practising territorial governance reflect though diverse modalities of Colonial Science (CS). Therefore the chapter aims to offer a theoretical development and assessment, of the relevance and interrelations of both PE and CS approaches.

‘Political Ecology’ is perhaps more accurately defined as the political economy of environmental processes and knowledge. In other words, political ecologists attempt to look through a political and economic lens into the varying aspects of environmental utilisation and management. For this thesis political ecology’s pioneering analysis of the ‘becoming’ of resources is especially significant. This political-economic perspective stresses the combination of political and economic forces and benefits that structure ecological and landscape change. However, it seems that its focus on structural imperatives downplays the contingent and precarious nature of individual processes and decisions. Therefore, I shall also work on ways such exploitations are enacted and stabilised by considering some crucial actors’ or decision-makers’ networks.

However, the purpose of the thesis is not an attempt to adjudicate the merits and arguments of specific theories. Rather, the main intention of this thesis is by borrowing some ideas from selected theories to seek to establish how far, and in what ways, colonial science articulates a distinctive mode of environmental conceptions and governance. It concerns largely and finally the entanglement between the government, science, and

knowledge.

COMBINING POLITICAL ECOLOGY FRAMEWORKS AND NETWORKS OF KNOWLEDGE FORMATION

Environmental knowledge, like any other form of facts, reflects the particular interests of specific individuals and collectives, for example in this research the colonial governments' conceptions pertaining to land and resource. In addition, to understand colonial knowledge formation, and the role of devices like maps and cartographic practices it is useful to draw upon network-related ideas. Instead of prioritising the framework of control over resources as Political Ecology suggests, network theorists such as Bruno Latour suggest that, the shaping of scientific knowledge (including territorialisation), is constructed through many connecting elements circulating inside tiny conduits (Latour, 2005: 4-5). The structure of exploitation is thus the stabilisation of many smaller practices.

Political Ecology and the Becoming of Resources

Political Ecology, has come to be seen as one of the most powerful approaches to human-environment relations. In March of 2008, the journal of *Geoforum* devoted one-third of its length to themed issue: *The Time and Place for Political Ecology: The Life-Work of Piers Blaikie*, Joshua Muldavin (2008: 687) suggests it 'has come of age. No longer peripheral, marginal, or outside the mainstream of academia, it is firmly entrenched in the curricula of most Geography graduate programs'. These concerns and debates inspire my research with their focus on the importance of political and economic structures to understanding the formation of environmental knowledge. However Muldavin continues (2008: 690-691) by saying it confronts the conundrum of on the one hand a trap derived from 'structuralist epistemology' and the other a need for critique of the role of 'natural science' in defining 'real' problems in which asymmetric power and knowledge are key analytical tools with a concern to recognise the constructed nature of knowledge. In terms of what the *Constructivist* approach suggests, as Mike Crang notes that, that we cannot directly access the world, and the categories and things we see are shaped by our interpretations rather than the world outside (Crang, 1998: 188). Coupled with that dilemma is how to both attend to situated knowledge and expand our knowledge across scales and cases. The human-environment relations in my study refer to the way imperial purposes intertwine with the colonial environment, especially through the formation of environmental knowledge. Here then I follow the openings in Blaikie's 'sceptical yet

pragmatic importation of post-structural ideas' (Muldavin, 2008: 692; Bryant & Goodman, 2008) to engage with contextualist accounts that stress the contingent construction of environmental knowledge.

Political Ecology encompasses a family of approaches and hence is applied by scholars with different thematic preferences, these scholars, of course, have their own multiple takes on the overall approach and the issues above. For example, in the words of Piers Blaikie and Harold Brookfield who pioneered the field of Political Ecology: the phrase 'Political Ecology' combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land based resources, and also within classes and groups within society itself (Blaikie and Brookfield, 1987: 17). Raymond Bryant, who has authored numerous papers on the topics of Political Ecology, natural resource conflicts and their ilk, claims that Political Ecology is an inquiry into the political sources, conditions and ramifications of environmental change (Bryant, 1997: 4-5). My thesis is especially interested in Political Ecology's concern about with the becoming of resources. That is to say that the thesis deals with mainly the way by which the colonial governments defined the environment as a governable object and were thus able to commodify the colonised territory.

Political Ecology, in general, could provide a series of reasons to demonstrate the links between human agents and environmental conditions. The critical themes, such as conflict, contest, and struggle, flag up why and how individuals and collectives defined, rationalised or systematised the environment as a source of resources. Furthermore, these topics also concern about the control, accessing, or utilisation of resources. In terms of the prospering progress on the field of Political Ecology, an honest metaphor made by one commentator proves still confident. Joshua Muldavin argued: *Just as there is a rediscovery of the importance of place and thus Geography, Geographers and others are discovering this critical approach to the human-environment dialectic that provides unique theoretical, methodological, and practical insights for unravelling the complexities of this contentious nexus* (Muldavin, 2008: 687). My thesis is indebted to political ecology's examination of the becoming of resource, fragmentation of power relations, and the social production of nature. As they are central to my analysis, each theme is summarised as part of a consideration of the wider literature.

Political Ecology pioneered investigations into how environments become resources, and the issues of why and how individuals and collectives take control of them and/or dominate the rights of ownership and utilisation. Broadly the analysis shows that colonisers used whatever form of government was expedient or effective to facilitate

resource extraction. For example, Richard Tucker (1988) claims that colonial administration re-defined the rationale of resource-use and this action led to landscape change. In this vein, he suggests that the British colonial rule in India could be seen as an elaborate system of resource extraction and allocation, determining which people could derive benefit from the system and consequently shaping the appearance of the landscape. Similarly, M. D. Olson (2002) examines the Samoan archipelago to assert that in most highly 'resource-dependent' societies, with all their different experiences under the rule of differing colonising states, including the territorial appropriation and interference in resource use and distribution, colonisation always produces unequal, if diverse, impacts on land and society.

Overall, Political Ecology is good at showing the fragmentation of power relations. That is to say the approach is capable of specifying a range of power relations. It is a pity that, however, while it attends to the dialectic of social interaction with biophysical processes, in the end more emphasis tends to be put on the analysis of politics rather on environmental influence. Raymond Bryant draws from feminist approaches to show the importance and advantage of considering natural and human processes simultaneously and equally. Taking the research of Dianne Rocheleau, Barbara Thomas-Slayter and Esther Wangari on feminist political ecology of Kenya's Eastern Province for example. Bryant suggests that 'the gendered visions for survival' could not be realised correctly without thinking recurrent drought and subsequent famine as well as long-term political and economic conflict in the region. In terms of women's survival strategies, a mechanism *mwethya*, which refers to labour exchange between local women, is created. Through *mwethya*, collective action by women in Machakos is capable of safeguarding environmental conditions as these relate to local livelihoods, as well as generating new income-earning opportunities for the women (Bryant, 2001: 158-161).

Peluso and Vandergeest, who specialise in the political ecology of Southeast Asia, have produced a series of outstanding articles and collections over the last two decades (e.g. 1995; 1996; 2001; 2006a; 2006b). Amongst their numerous works, they highlight two key issues of, first, how the state was established and empowered by territorialising its land; and second, how the state and market interventions have been reflected in social and environmental changes. They are particularly interested in exploring relations of 'territorialisation' and 'state power', which they suggest unfold in the following ways. In terms of territorialisation issues, Peluso in her study relating to ethics of access, property zones in *Anthropogenic Forest* in rural Indonesia argues that zoning has both temporal and spatial aspects. The temporal aspects spring from the changing resource tenure

arrangements that people are engaged in at different points in their life cycles. The ethic of access worked to regulate this temporal zoning, lending credence through its discourse to the redistribution of access between people of various age groups (Peluso, 1996: 544-545). In terms of state power, they suggest that it would be impossible to realise the operation of modern professional forestry, if we do not take hybrid effect of socio-nature into account (Vandergeest and Peluso, 2006a). For example, Vandergeest and Peluso claim that, overall, variation in professional forestry practices on a regional level was closely related to the nature of state power, the different configurations of local politics in the different sites, and the way that these politics were mixed up with local economies and ecologies. They further declare that political differences in turn shaped the ways that forestry departments were integrated – or not – into empire-based forestry networks (Vandergeest and Peluso, 2006a: 40).

Political Ecologists, frequently but not always influenced by various forms of Marxian thought, prefer to utilise 'structural' approaches to nature. The social production of nature and the monopolisation of nature have become the main interests of many researchers. Take Erik Swyngedouw's (2003) work on modernisation and water in Spain, for example. Through a reconstruction of the multiple and often contradictory narratives on hydraulic landscape at the turn of the twentieth century, he claims that geographical conditions could be seen as 'the outcome of a process of production in which both nature and society are fused together in a way that render them inseparable, that produces a restless hybrid quasi-object'. Thus, this perspective tends to investigate the ways in which monopoly power dominates nature or the environment.

There have been queries in relation to the Political Ecology's bias and limitations. Firstly, for researchers interested in the influences of material non-human systems on human ones, the approach offered in foundational political ecology was unsatisfying. For example, Paul Robbins and Kristina Monroe Bishop suggest that in classical political ecology the 'environment' is always local and usually takes the form of an event, and so is always an outcome of something else, positioning it at the far end of an explanatory chain (2008: 750).

In order to overcome the drawback of paying little attention to the mechanisms through which nature is conscripted, some practitioners of political ecology have begun to investigate using concepts of networks. The arguments of Peluso and Vandergeest, for example, have gradually shifted from political ecology to network approaches over time. So in their latest text, 'Empires of Forestry', Peluso and Vandergeest claim that colonial forestry is more accurately understood as linked sets of sites, differentially integrated into

intersecting imperial networks. It is in these networks that European models for practising professional forestry were transformed into hybridised practices through interactions with local ecologies, economics and politics (Vandergeest and Peluso, 2006b: 383-385).

Network Approaches

Some studies of colonialism adopt network approaches to look into the cultural transcription, although they specifically focus on the understanding of scientific knowledge in modern times. In a classic study, John Law depicted empire as assemblage of technologies. As one of pioneer actor-network theorists, Law is interested in the control at a distance through imperial trade and the stabilisation of empire as a topological and topographical network (Law, 1986: 231-260). Law's study focused on the technologies of trade and navigation, but network approaches can also reveal much about the constitution of populations and territories. For instance, Daniel Goh's (2007) comparative study of British Malaya and American Philippines at the turn of the nineteenth and twentieth century, tracks the development, dissemination and effectivities of the book '*A Dictionary of the Malay Languages, Malay-English, A-G*'. Goh shows it reflects not only the views and attitudes of its composer, but also implicates imperial administrative networks. The dictionary was compiled by Frank Swettenham, whom we have already encountered as a Resident in Malaya and Hugh Clifford, high officials in the British Malayan Civil Service. Goh compares the dictionary with R. J. Wilkinson's Malay-English dictionary. Goh asserts that the definition of '*Adat*,' which means norms or customs and which we will see was strongly linked to Mukim land tenure, had been omitted partly or modified to some extent by the imperial administrators cum authors. These amendments had the effect of formalising traditional practices as customary authority in modern legal statutes (Goh, 2007: 120-121), while other intentional omissions downplayed the Chinese influence and excluded Chinese participation in Malay customs (Goh, 2007: 122-123). Here then the dictionary is positioned as one of the vital, yet banal, tools of colonial governance, literally translating power in its circulation and use. For example, Goh also points out that the differing composition of ruling classes might lead to divergent operating politics, such as divergent racialisation of similar societal situations of mass resistance that took place in the Philippines and Malaya. Although the final purpose was to ensure effective rule, the ways the two types of imperialists adopted are different. In the case of Malaya, British officers who were trained as cultural anthropologists were required to speak the native tongue, to live amongst natives and participate in their activities. On the other hand, the American colonial state in the Philippines used methods that began their life as intelligence-gathering

about the hostile reaction to American overtures (Goh, 2007: 114-115).

The example above, suggests that it was not through force of logic or the action of powerful interests, that colonial governance was rendered rational and its categories enacted but through the small scale and technical process of transformation or translation. In a similar vein my research compares British/Japanese imperialism via variations in similar ruling systems related to land administration.

Another contribution, by Mark Harrison, also demonstrates the importance of networks. Harrison is one of renowned experts on colonial history of medicine. He adopted this approach initially implicitly in his account of public health measures in British India (1994), as a means to bring together the web of observed contradictions and rivalries, within the imperial order itself, which included shortages of revenue, indigenous resistance, competing claims on the resources of local and central government. Public health offered him the lens to illustrate and expose the constellations of interests and processes. A decade later, drawing from network concepts once again, Harrison completed an introductory work on Colonial Science, particularly the History of Medicine. He highlights interactions with indigenous scientific traditions and the use of networks to realise scientific works (Harrison, 2004; 2005).

A network approach allowed Harrison to acknowledge all actors, objects and materials that together comprised medical issues in colonial India. For example, he approached the nature of British imperialism in India through public health system and medical policy which entailed tracing discourses in India and Britain, among scientists but also urban planners. This is important in my own study as it will unpack colonial administration via land systems, that were produced through the translations and circulations of discourses and practices through a network of institutions and actors such as surveying bodies, scientific expeditions in the colonies, scientific institutions and publications in the metropolis, administrative practices and indigenous actors' responses. Within the different temporal-spatial-socio contexts, the different modes of organising the colonial science were created and these both inflected and enhanced the nature and reach of the empire specific rationalities.

A 'network' approach then allows work to both follow European devised taxonomies and nomenclatures as they were used to comprehend and often appropriate colonial subjects and territorial resources; and how these European-made categories subsequently tended to be decontextualised and taken to represent objective and universal ways of knowing (Schiebinger, 2005: 54). Following the ethos that concerns about indigenous science has privileged since the 1990s, Harrison makes the point that even at the 'High

Noon of the (British) Empire', there was far more reciprocity between indigenous European and various non-European knowledges than conventional models recognise (Harrison, 2005: 61). He sees the knowledge as hybrid of the coloniser and the colonised. The network is then about located translations and transactions in globalised networks responding to always local conditions.

Knowledge Organising Networks: State, Societies, and Missionaries

In Londa Schiebinger's account the organisation of science within, across, and throughout Europe and its colonies, a minimum of five categories of actors appear - states, physicians of trading companies, scientific societies, normal settlers and merchants, and missions (Schiebinger, 2005: 53-54). Different empires had diverse organising logics, and thus different compositions of actors from different categories. Among these categories, the well-organised groups and institutions most obviously reflect the features of different empires and represent the will of imperialists- although the roles of specific individuals or other organisations are not to be dismissed. Whilst key individuals might play a vital role at key junctures it is important to displace the imperialist hagiographies of (usually) great men by attending primarily to the organisation of knowledge and its organised production. Accordingly, three types of collective actors will be taken for detailed examination: states, societies, and missions.

State

The State, as the most obvious and powerful form of organising colonial science, has received much more attention than any other actor. For example, French science becomes one of the well known models among the European and American academic spheres, just like the development of Japanese science within the East Asian context. Science was funded by states, such as France, where from the seventeenth century on the king and his ministers mobilised material and intellectual resources centrally through the Parisian Jardin du Roi, or the king's gardens in Paris. (McClellan III, James and Regourd, 2000: 32)

In most cases, the government organs, like the survey departments, were created to implement the authority's ideas. They are often though not purely scholarly in practice but forced to take charge of some kind of administration of affairs. The two sides of the activities are not seen as conflicting. For example, Elri Liebenberg examines the Topographical Survey of the Orange Free State, created by the British War Office between 1905 and 1911, and finds that it was not only one of the first but also one of the finest topographical surveys to be undertaken in British colonial Africa. He suggests that three

reasons motivated this survey, that is, the civilian officer's interest, the military need for maps, and the colonial administration's purposes (Liebenberg, 1997). The latter two motives correspond actually to the will of rule and efficient governance.

In the case of Japanese Taiwan, the state, needless to say, occupied the leading status in the promotion of science with the colonial rule. As we shall see as early as Formosa became a dependency of the newly-emerged empire in 1895, the Japanese Imperial Diet sponsored separate surveys there. These expeditions were assigned to the College of Science and the College of Agriculture which were affiliated with Tokyo Imperial University. The disciplines which participated in this enterprise were mainly natural science based, including anthropology, botany, geology, silviculture and zoology.

Societies

In addition to the governmental enterprises, the historians of science have become much more interested in the activities of a quantity of leading and learned societies. These institutions featured as scientific bodies but were actually subordinate to the government to a great degree. Apart from the renowned Royal Geographical Society, which was founded in Britain in 1830 and has drawn considerable attention (Driver, 2001), many experienced or newly-emerged empires established and promoted their own scientific societies, and whilst those such as the *Paris Soci  t   de G  ographie* (1821) in France (Staum, 2000; Heffernan, 1994: 92-114), the *Sociedad Geogr  fica de Madrid* (since 1876) in Spain, have attracted critical attention far less has been paid to the *Tokyo Geographical Society* (東京地學協會, since 1879) in Japan¹². Not only geographical societies, but also the new professional bodies of other disciplines, such as the anthropological, botanical and geological societies, sprang up in the high colonialism of the nineteenth century like bamboo shoots after a spring rain. It is not surprising that no matter how different their interests were or how distinct their structures, the scientific societies supported the colonial expansion of their respective empires as well as fostered the design and implementation of colonial administration. These learned societies were also semi-official and partly sponsored by the authorities and were the facilitators of diverse surveys as well as acting knowledge exchange centres or, in ANT's vocabulary, *centres of calculation* (Latour,

¹² On Japanese learned societies/empire, see Takeuchi, Keiichi 1994, *The Japanese Imperial Tradition, Western Imperialism and Modern Japanese Geography*, in *Geography and Empire*. That takes very much the link to geopolitical theory, although it does not really look at colonial administration. Also see Karen Wigen's work (2005) on gathering and disseminating up-to-date geographical knowledge in early 20th century Japan, *Discovering the Japanese Alps: Meiji Mountaineering and the Quest for Geographical Enlightenment*, *The Journal of Japanese Studies*, 31(1): 1-26.

1987).

Some scientific bodies served the will of colonial regimes through combining the ideologies and practices. An archival study conducted by Martin Staum (2000) on the Paris Geographical Society, revealed that influential Society members were not just erudite, disinterested scholars, but keenly interested in extending French commercial influence in the western Sudan, the horn of Africa, and the South Pacific. Their scientific practice of constructing the other by classifying them as uncivilised had legitimised the colonial government. In other words, exploring the activities of French geographers of the early nineteenth century illustrates how concepts of racial hierarchy and practical projects of empire often were mutually reinforcing.

In addition, scientific societies often played a formative role in collecting, circulating, and publishing a great proportion of the knowledge pertaining to their respective empires. However, these centres of calculation depended upon a circulation of people and artefacts between metropolis and colonies. The interests of the British metropolitan societies, for example, were directly expressed in the geography of the new annexed territories of the Malay Peninsula. New records and reports concerning the general geography always followed the increasing British intervention in these Malay States. The first geographical account which outlined the sultanates subordinated to the British on this peninsula was presented to the Royal Geographical Society of London by William Barrington D'almeida in 1876. D'almeida, a fellow of the RGS., had contributed another geographical record or travelogue '*Life in Java, with sketches of the Javanese*' previously in 1864. Little is known about his career based in the vicinity of Singapore, although D'almeida collected, organised, and introduced the geography of the region to the members of the RGS, covering aspects such as the natural landscapes, economic activities, and political situation. The connection of scientific interest to colonial expansion is revealed when you see that the article was published in 1876, barely two years after the official 'Pangor Treaty of 1874' which was ratified between the British government and the Sultan of Perak and so must have been based on field trips almost directly following the treaty.

However, the geographical interests in the new territories were transferred from the core institutions to bodies in the colonies in later decades of colonial administration. Similar tales which aimed to facilitate the opening up to knowledge of some of the least-known parts of this country were told constantly within the territories themselves. They include such things as the Johore description (1894) by Harry Lake, an Engineer in the service of the Sultan of Johore, compiled after the Treaty of 1885; a paper regarding a 1895 journey through the Malay States of Trengganu and Kelantan by Hugh Clifford (1897), not long

after they were placed under the British protection. With the setting up of a local society in Singapore in 1878, the Straits Branch of the Royal Asiatic Society, there was a centre of knowledge production, storage and exchange within colonised space and more and more geographical essays about Straits Settlements and its neighbouring Malay States began to be published in the Journal of this society. Simultaneously, the scholarly for a based in England lost their initial enthusiasm about the peninsular geography and fewer talks and papers appeared in the metropole.

Missionaries

Although the missionaries and missions sometimes contested the production of knowledge from other official and scientific organisations, they also reached the places that many other official institutions could not reach. For example, the missionaries in pre-colonial Taiwan, although their main purpose was to disseminate the Christian belief, also enhanced geographical knowledge about the inner part of the Taiwan island. In *Nature and the Godly Empire* (2005), Sujit Sivasundaram offers a nuanced account of the relationship between science and missionary work in the Pacific. He argues that the context of increasing secularisation of knowledge made a form of religious scientific practice on an urgent necessity for missionary bodies (Sivasundaram, 2005: 210). Sivasundaram ultimately concludes that missionaries provided a distinct and competing form of scientific knowledge in the early nineteenth century. In the context of China this religious knowledge needs to be set in the context of the long run presence of the Jesuit missionaries who had been collecting and transmitting systematic, if not always scientific, knowledge since 1547 and the instruction from Ignatius of Loyola which expressly requested periodic reports to the Rome on missionary work, 'its objective conditions and specific problems due to the circumstances and traditions, the customs and the conceptions of the host country' (Giard, 1991: 215).

Furthermore, some other denominations of missions followed the Jesuit precedent of not only making observations but also delivering formal reports on the people and the land they encountered. One example regarding the conceptualisation of and the responses to climatic variability in colonial South Africa is given by Georgina Endfield and David Nash (2002). They employ a range of unpublished and published missionary correspondence and travelogues to examine the British interactions with local cultures and environments. One of the key aspects of this article is an exploration of the way in which missionaries positioned climate variability within a moral economic framework as illustrated in their attitude towards local drought myths and rainmaking superstitions. It reveals considerable

conflicts in the respective environmental ideologies of missionaries and the local populations. Moreover, whilst missionaries appear to have linked drought to moral degradation, local populations had their own 'environmental religion' or climatic philosophy that located the arrival of the European within a framework of climatic change (Endfield and Nash, 2002).

The production of knowledge about the local area, whether of geography or folklore, by religious bodies might suggest quite different models in the Malayan and Taiwanese experiences. Because the British authority did not intervene in, in fact specifically protected, the Malay religious affairs in these Protectorates, the missionary sphere of influences was naturally covered by the settlements and districts of the European, Chinese, and Indians settlers. Thus on the Malayan side, with limited support and scope to proselytise, we could suppose that the footprint of the Christian missionaries were spatially confined. On the Taiwanese side, however, the activities of Western missionaries, especially the Presbyterian ones, constituted the chief parts of documentation and representation of human or landscapes of the island before the Japanese occupation. Through the entry point of treaty-ports in late imperial China, the missionaries, as well as other officer and technocratic foreigners, were granted access to the internal frontier of island. This loosely connected group of individual explorers helped to shape the knowledge relating to this island in pre-colonial period.

Environmental Consideration

Power and environment are often tortuously intertwined and these intimate connections play a crucial role in shaping territories and making cultural landscapes. If we have seen in the previous section how knowledge circulated around colonised places and was translated through key locals and actors, then it is also responded to the exigencies and possibilities created by the local environment. Therefore, I shall highlight the effects engendered by the environment and environmental processes on the land demarcation.

Environmental attributes played an important part moulding the sub-division of forest or land management areas in colonial Taiwan and Malaya. To look at Taiwan, for example, the fact that most of the valuable economic forests covered the higher altitudes in the centre island restricted the possibilities of transporting felled logs outward. When river flow, cableway, and rails remained the dominant traffic means, valleys and river systems naturally became the only timber-collecting routes, thus the units for forestry administration from the Forest Management District to Forest Compartment (林班) scales were usually delimited in accordance with watersheds or catchments. How apparently

'natural' regional units were shaped by technologies of exploitation is revealed in how post-colonial FMDs have gone over the natural boundaries of river basins, because the new timber-collection systems are mainly dependent on lorries. The roads used by motor vehicles traversed the rugged hills forming the watersheds. Therefore, the introductory chapter of each Forest Management Plan released during the colonial period always had similar statements to define administering extent that based on the boundaries of particular watersheds. For example, the Chikuto FMD was within the catchment of the Tozen River, while the Taikei FMS was formed in the Taikokan Valley. A tier of ranges separate the Taikei FMS in the northeast from the Chikuto FMD in the southwest. Watershed here clearly facilitated the territorialisation of forestry space. As we shall see the topography was often used as justification for specific forms of territorial units, but the fluidity and change in those units suggests that FMDs cannot be seen as a natural expression of forest patterns but rather the articulation of silviculture and transport technologies.

The specific environment considerations revealed in environmental knowledge are bound to lead to different modes of interaction between human agency and physical settings. Take the central mountain areas in Taiwan for example. Due to forestry-based land strategy, the conditions of transportation became the prime factors to direct the industry. Because the most convenient transporting type available is the river system, the forest management units naturally tend to fit with the watersheds. It is important for theorisations of territorialisation processes to accord due weight to the interaction of distant and local knowledge, along with the practices on the ground that are keyed around the physical environment. All too often theorisations move to the abstract and lose both sight of and fail to make room for the difference the physical environment makes.

TERRITORIALISATION WITHIN THE COLONIAL SCIENCE

The marriage of science and colonialism drawn increasing academic scrutiny since the 1960s. Modern states clearly deploy science to enable their governance over people and land. This it has become clear was also true of the management of colonial territory. Colonial administrators, as much as their metropolitan peers, were clearly acquainted with the significance of scientific techniques in practical matters of rule, such as how statistics helped the understanding of demographic quantities and components, how public health and environmental hygiene (Harrison, 1994), and how botany improved agricultural production (Drayton, 2000). In my context, the way by which the government learned and adopted from the extent of scientific practices aiming to promote colonial rule was called colonial science.

Territorialisation refers to the way in which the colonial authorities define as well as demarcate the colonised environment. It is not only the simple tracing of ‘natural units’ such as terrain types and river systems, but the identification of such ‘natural unities’ and their subdivision, alongside which is the parallel and related identification of human landscapes and ‘units’, such as settlements or group boundaries. The most important factor of all is that, in addition, it reflects the coloniser’s intention about the arrangement and allocation of land utilisation and reveals the interests and rationalities of empires.

The application of scientific logics, methods and tools to colonial administration usually made its rule more convenient (for the rulers) and efficient (at least for the rulers). These practices together can be regarded as the implementation of colonial science. At least three processes of implementation can be seen in amongst the British or Japanese colonisers. First, from their metropolises, empires recruited scientists and experts from a range of disciplines to undertake the expeditions or explorations in new territories. Second, from the older or the previously colonised acquisitions, empires transferred experienced civilian engineers and employed them to take charge of the environmental surveys and researches in a diversity of kinds of infrastructures and public works, from drainage systems, to transport networks and harbour works. Third, from within the individual colonies, empires appointed the staff and clerks in local government offices to conduct inspections and study tours, to become acquainted with the environmental affairs and conditions. All of the practices above form the basis of territorial governance, and their ultimate purpose was to promote and enhance the colonial administration.

Accordingly, this section of the chapter tracks the practices of territorialisation within the context colonial science. To demonstrate how the notion of territory or the processes of territorialisation is bound to colonial scientific practices, this section reviews representative studies on territorial governance and colonial science respectively. The former addresses the accounts mainly produced through the approaches of political science and social/spatial theory, while the latter mines the production of public health and race/ethnicity knowledge. We find that, not surprisingly, the concept of governmentality has appeared frequently and been examined in separate academic clusters. The relationship of the studies discussed here is clearly linked to how they have borrowed the notion of governmentality from Foucault and deployed his analytical device into colonial scientific situations.

However, there are still some variations shown here. On the one hand, the former researchers, who are interested in issues of territory, recognise governmentality as ‘the government of space’ and take it for granted that to investigate the ‘space’ means considering the territorial operation of governance. On the other hand, the latter group, the

colonial scientists, focus on the broader issues of such as people, race and ethnicity. In other words, there are few individuals that relate governmentality to environment in one way or another. There are some studies of development, environmental conservation or eco- governmentality, but these are not the issues that are central to this thesis. Nor does this thesis intend to develop a whole new mode of approach to territory and territorialisation studies, by tracing some genesis of colonial sciences and pinpointing the function of environment. Rather, I intend to consider that if it is possible to approach the territorialisation of colonial environments, through Foucault's framework of governmentality.

As a new field of research that emerged in the 1960s, there are still many things to be explored in Colonial Science. An examination of some dominant paradigms in relation to its definition, shows there indeed exists a considerable diversity in colonial science research in terms of interests and insight. However, it is safe to claim that colonial science constitutes itself as a distinct subfield of humanistic and social sciences, since the researchers form a community of practice united by a belief that science shows colonial features since the late nineteenth century and a common research technique, that is discourse analysis.

Colonial Science

Colonial Science necessarily emphasises the roles science and/or technology played in exploring, governing and "improving" the land and/or people of colonies. In the eyes of many colonial administrators in the nineteenth century, the advance of science and the advance of colonial rule went hand in hand. Colonisation and science were both vehicles for modernisation. As Michael Adas suggests science was bound to the colonial project in three ways: first, scientific prowess was seen as embodying modernity and thus helped to ideologically justify European domination over other peoples; second, its findings helped to transform production for an expanding world economy; and finally, most significantly for this thesis, it helped to actively secure colonial rule of territories (Adas, 1989). The investigation of the subjects and objects in colonies through a range of disciplines created apprehensible constructions out of formless phenomenon. The study of colonial science, which emerged in the middle of 1960s, has made at least two contributions of significance. On the one hand, the colonial, as it might be styled, opens up standard accounts of Europe's scientific revolution or big science to rich and new interpretation (Schiebinger, 2005: 52). On the other hand, scholars have begun to recognise different periodisations in the interaction of different knowledge formations and colonial regimes, with science more

prominently and instrumentally featured in the colonialism of the last quarter of the nineteenth century compared to the previous periods. Science had been made to serve the interests of imperial efficiency and colonial development (Macleod, 1996: 87-88).

There is no agreement, however, on the definition and extent of colonial science studies among the academic disciplines concerned. For some historically trained experts, 'colonial science' has referred to any science done in Europe's overseas territories (Harrison, 2005). For other historians of science, such as Londa Schiebinger, colonial science involves a broader vision is used to mean any science done during the colonial era that involved Europeans working in a colonial context (Schiebinger, 2005). However, the sort of definition stated above is obviously Eurocentric and leaves us in ignorance of any other colonial regimes in other continents, such as the Japanese and American empires that emerged in the nineteenth and the twentieth centuries.

Still others approach colonial science in cultural and political perspectives respectively. For example, Kavita Philip claims colonial science in its nature, is a form of culture comprising a distinct constellation of the multiple, tangled narratives of race, class, gender, nation and scientific progress together (Philip, 1998: 300). Educated in anthropology but inspired mostly by political science, Kalyanakrishnan Sivaramakrishnan terms colonial science carefully and technically, as a network of ideas and practices that constituted the scientific corpus of colonial governance, that is, technologies of power. He also locates the production of colonial science in specific historical moments and geographical locations and argues this diversity contributes to the possible heterogeneity and contested features of colonial science (Sivaramakrishnan, 1999: 212-213). Crucially for this thesis, then this work points to the need to unpack colonial science from the notion of a singular imperial history (and practice) and to unpack even individual colonial states into their diverse apparatus and institutions, in order to understand contests and disputes within the ruling power.

Nevertheless, I prefer the simple but practical definition supposed by David Gilmartin to other approaches. Gilmartin does not use the term 'Colonial Science' but instead chooses the phrase 'science of empire' or imperial administration. He suggests that science of empire is not simply a structure of domination, but also a distinctly political system linking the colonial state and indigenous societies together in a common political order (Gilmartin, 1994). More specifically, my thesis claims that colonial science is what the colonial authorities employed by way of exploration surveys, defining discourses, and demarcation practices to help to lay the foundation for their power.

A Brief History

The history of science, as one of the oldest and largest research clusters related to the community of the colonial science, and indeed some would say colonial science studies is but one part of this diverse, ambiguous, and disputatious collection of academic interests. Colonial science, according to Mark Harrison, made its first appearance as one seminar essay of *'The Spread of Western Science'* (1967) in George Basalla's pioneering contribution in the mid 1960s. Based on the historiography of diffusion, Basalla posited a model for the circulation and development of Western science. He claims that, analogously to the colonial economic model, the colonies provided raw data and materials for higher level processing, that is scientific analysis, in the West (Harrison, 2005: 57).

The diffusion notion attempted to locate and track the knowledge of scientific progress in colonial context as a historic-geographical phenomena. It thus saw the circulation and transmission of scientific knowledge from the west, followed by scientific practice. It was only slowly accepted as a radical challenge to historiographies of scientific progress that tended to be untrammelled by concerns with the roots and uses of knowledge. As Roy Macleod vividly described it, 'until the 1970s, selling the history of colonial science to historians of science was like selling a little-known commodity low in a falling market' (Macleod, 1996: 87). Although predictable and considerable drawbacks are embodied in the diffusionist perspective, this methodology offered a practical stratification or periodisation of the development of science. One example of such a periodisation is offered by the recent study on scientific and technological development in Africa. Frank Teng-Zeng advances a framework that identifies at least four phases of scientific and technological development in Africa: a pre-colonial phase, a colonial phase, a national phase and a post-national phase (Teng-Zeng, 2006). Among them, Teng-Zeng claims that the progress of science and technology in colonial phase was dominated by European scientific organisations. Most important of all, this approach picks out the colonial filling from the scientific sandwich, that is, it reminds us of the role the colonial experience played in the development of scientific knowledge.

Building upon Mark Harrison's ethos, Ian Barrow suggests that three approaches have characterised colonial science studies (Barrow, 2008: 9-10). The first analytic method is the diffusion concept, explained above, which he argues reflects the influence of development theorists in the atmosphere of the 1960s. The second methodology is inspired mostly by subaltern studies emerging in the 1980s which emphasises how indigenous scientific traditions and practices were ignored, derided and erased. This methodology recognised the complex power relations that existed in colonies, with particular reference

to South Asia, as well as challenging the priority given to Western actors in the previous approach. It has some links to political scientific visions discussed in later sections of this chapter. The third approach is based on postcolonial understanding which is advocated by David Arnold. In Arnold's words, technology as a form of colonial science acts not as an instrument of power relations rather as a cultural space in which various forms of interaction and exchange, of mimesis and reversal, become historically possible. He concludes that the history of technology or the history of science here thus becomes less an investigation of origins and inventions (a history that has long privileged Europe) than an enquiry into uses, meanings, and effects (Barrow, 2008: 10). Arnold's focus enables historians and other social scientists to consider more possibilities than previously existed in the new field of study. Before turning our attention to the responses from other disciplines, it is worth spending some paragraphs reviewing the work contributed by those historians to the colonial science community.

Overall, historians of science often focus their interests on the issues of the origin, development, and influence. As a group they tend to view science or knowledge as a process of discovery or creation by individuals or people, and thus their debates are prone to revolve around the questions of how the coloniser invented knowledge and/or how the colonised was organised into a new form of knowledge. One special journal issue focusing 'colonial science' was published in *ISIS*, by the History of Science Society reveals the analytic approaches that have been coming to the fore recently. In the introduction of this special issue, Schiebinger quickly guides the reader through 'the European Colonial Science Complex' using a several analytic visions. In doing this she asks that historians move from focusing on who did colonial science and to what ends, to consider more strongly how the knowledge was organised. She grounds the contributions in that special journal issue in terms of core-periphery models. She claims that each author draws attention on reciprocal influences and multidirectional flows of materials, knowledge and people between multiple centres (some European, some not) and diverse peripheries, while undertaking his research (Schiebinger, 2005: 52-55).

Discourse

The production of discourses, inclusive of classification and quantification, ranking etc., is one of key means in the practices of colonial science and a key area where critical genealogies can destabilise the apparent self-evidence of scientific findings and accomplishment to reveal its ideological underpinnings and contingent fabrication. Classification, for example, became one of animating spirits in the field of colonial science,

as it simplified the complexity of colonised items, such as people, animals, plants, and environments, codifying them into stable groupings and therefore made them calculable and manipulable. Revealing both the power of classificatory systems, and the way they betray the interests of the classifier rather than the purported inherent logic among the things is, of course, the foundational move in Foucault's 'Order of Things'. There he takes the fictional and absurd categories of the Chinese Emperor's encyclopaedia to both stage the exoticising of non-western rationality and show the arbitrariness of apparent Western rational classification. For colonial science, foremost amongst the numerous objects demanding to be categorised were people and land since they were inevitably the main concerns of the colonial authorities (Hoffman, 2008).

The use of the word 'discourse' here betrays the influence of Foucault in the field, though it is often used in a slightly wider sense than in his studies. The term is used here to suggest that different ruling collectives such as scientific engineers or civil administrators, should not be conceived as competing colonial classes or groups, but were two coherent, but distinctive, modes of scientific thinking, which were often in tension within the thinking of the same individuals.

Through a range of discourses and representation about land and territory, colonial science helped shape the cultural landscape and its perception. The most frequently mentioned discourses are the notions of improvement and progress. In terms of improvement, David Arnold connects romanticism and improvement in a masterly fashion in his work *The Tropics and the Travelling Gaze*. The doctrine of improvement, well established in India by the 1820s and 1830s, was often depicted as ridding India of its ruins and restoring it to what it had been at an earlier, more peaceful and prosperous time. One of Arnold's most telling examples quotes the remarks of Captain Baird Smith, one of the participants in Ganges-Yumuna Canals, that 'This great tract will become the garden of the North-Western Provinces; and we shall hear no more of the devastating famines, which have hitherto swept across it, bringing physical wretchedness and moral degradation in their train' (Arnold, 2006: 109). However, he shows that this discourse also signified a desire to transform the country into something that looked and functioned like the rural landscapes and agrarian economy of contemporary Britain (Arnold, 2006: 105). The improvement discourse about engineering canals in northern India shows how they were expected to work their same transforming effect in 'tropical agriculture' that they were believed to have accomplished in Britain.

Quantification featured as one of the critical means in colonial discourse. For example, in a study about colonial governance in German East Africa, Thaddeus Sunseri points out

clearly that quantification of physical environment, forest in this case, was an imperative to scientific forestry there. Sunseri observes how, upon arriving in their African colony, Germans adapted their traditions of scientific forestry to colonial and tropical conditions. While foresters in East Africa were confronted with different forests and landscapes from in Europe, their major goal remained the quantifying of timber for fiscal and commercial exploitation and the curtailing of rural people's access to forests (Sunseri, 2005: 369-373). Technologies of governance thus 'framed' the woodlands with a systematic ordering of objects, and classification. The method of mapping was especially developed to quantify forestry space. The topographic mapping of forests thus entailed definitions of 'forest' characteristics, and the reduction of aboreal varieties to simplified typologies. The heterogeneous woodlands are thus rendered into measurable, calculable and commodifiable resources (Demeritt, 2001: 431-459). The apparently objective and neutral modes of representation of these framings were often then maps that became crucial tools of governance.

In general, there are three main types of discursive differences in the reality of colonial science, that is discrepancy between government departments, conflict between bureaucrats and technocrats, and whether local society, and thus knowledge, was included or excluded. For example, civil administrators and engineers in the British Raj shared a wide range of values that, in spite of any disputes, fuelled an extraordinarily rapid expansion of British canal irrigation in the Indus Basin in the early twentieth century.

Variations within colonial networks affected colonial science production. Colonial policies, although often enacted in the name of officers of high rank, whose names and 'deeds' became the staple of imperialist triumphal historiography, were often discussed and refined within the ruling collective – where there was a community of practitioners whose norms and expectations evolved and shaped the conduct of science. The limited resources in the colonies, political interests and power struggles between different sectors and services under colonial administrative structures, and their contingent outcomes, all led to differences in policy-making from one colony to another.

Raymond Bryant (1996) demonstrates these processes of internal contention in the context of the formation of the forestry discourse in British Burma. The main dispute occurred between forestry and civil (agricultural) officials, over whether to convert forest to permanent agriculture or to retain it for long-term commercial timber production. A similar conflict between different state agencies with differing visions of economic imperatives and potentials resulting in contradictory policies has been documented in Taiwan during the period of Japanese rule concerning the rice and sugar authorities

(Chi-Ming Ka, 2003). Bryant reveals the discrepancy between the discourse of forestry as progress and the politicised reality of colonial forestry as well as the links between them. He recounts the official/forester's contested versions of tropical forest use and management. These officers, for example, divided the forests in Burma into two kinds, 'focus' and 'marginal'. The former was designated as commercial use under state forest control, while the latter was allocated for subsistence use under local forest control and indigenous management - issues which will figure large in the management of both Malayan and Formosan forests.

Conflict between different bureaucrats and technocrats has been revealed in several studies of colonial science discourses. Disputes seem particularly evident in efforts to control water and forests. In terms of water control, in David Gilmartin's analysis of the Punjab canal colonies, canal building involved not only technical innovation but also a political balancing act. The scientific concerns of British hydraulic engineers came into conflict with the social management imperatives of imperial rule as expressed by British administrators. As technical experts increasingly joined generalist administrators, they came into conflict over the relative values in state structures of local knowledge versus the putatively universal and impartial principles of science (Gilmartin, 1994: 1141). In terms of forestry, Vandergeest and Peluso examine similar issues about professional forestry and state power in Dutch and British colonies. They find colonial foresters clashed with civil administrators over territorial jurisdiction and, therefore, were forced to make accommodations. These foresters could not simply implement universal principles of forestry as established by emergent European professionals. Vandergeest and Peluso (2006) thus offer a cautionary tale against a simple diffusionist model of imperial forestry bringing Western scientific practices unchanged scientific practices to the colonies.

It is thus one aim of this thesis, that through a comparison of colonial Taiwan and Malaya we can reveal the differentiation as well as commonality of scientific discourse. Whether discourses about improvement, progress, or other issues, they reflect the intention of colonial authorities to define the meaning and assign features of their possessions to categories enabling their utilisation. Through the process, the colonial governments legitimise and rationalise their governance. The colonised were forced to inherit the ideas the coloniser made and to admit it should be the best consequence. Following genealogical approach, the forthcoming cases of Japanese Taiwan and British Malaya in later chapters will present and discuss how their separate discursive formations and discourses about their dominated territories were developed. For example, although the colonial Japanese

government triggered the botanical, geological and forestry surveys in the highland Taiwan, there is no inevitable step from there to how the preferred development of forestry was determined eventually as one necessitating removing indigenous forest users. So the Malayan system of forest reserves, which was transplanted from India, did continue to admit the Malay races access to extract woods for fuel and roofing from the demarcated areas.

Territorialisation

The sense of territory in human society has on occasion been argued to be rooted in biological nature. In ethology, sociobiology and behavioural ecology, the term territory refers to definite area that an animal of a particular species defends against other species (Sack, 1986). However, for this thesis the concern is with the division of the earth's surface into units, especially the political-territorial units (Storey, 2001: 1). Such a territorialisation is an imperative for land administration in both modern states and colonies. James Scott (1998) has argued that it is through a cadastral and cartographic imaginary that states come to envision their spatial extent and population.¹³

Territorialisation is thus a process that happens when the government is pursuing many other purposes, such as collecting revenues, governing people, or utilising resources, and uses the division of land to create legible objects upon which it can act. Colonial intervention into native land matters relied on the ability of colonial knowledge to re-inscribe the landscape through technologies of rule, such as creating administrative units, mapping and surveying the land, creating boundaries, writing land laws, delineating which areas could be used by whom, and creating land titles to legitimate peoples' use of the land (Vanderveest and Peluso, 1995). There is then a labour of discursive construction, defining forest territory as legitimately the property of, or best used by, the state. The state might thus de-territorialise areas, in the sense of abrogating previous regimes of (local) knowledge and dissolving previous units of occupation by declaring the area to be an 'unorganised district', because its 'human geographies were simply beyond the view and control of the state' (Rossiter, 2008: 216). This then was often coupled with techniques for visualising the forest that ostensibly naturalised these constructions and yet actually re-territorialised the land in the image of the state. This way of managing information epitomized the Foucauldian symbiosis of knowledge and power that was the basis for developing and ruling the territory through the colonial project.

¹³ Tongchai Winichakul's standard work *Siam Mapped: A History of the Geo-Body of a Nation* (Honolulu: University of Hawaii Press, 1997) also provides a classic account.

Territorialisation was especially pronounced in the era of colonialism with the transfer of control of land that is its *sine qua non*. It originated from the need for territorial management after land appropriation that characterised colonialism. Colonialism may be defined as the policy of maintaining colonies, the policy of exploitation of ‘weaker’ peoples.¹⁴ The linking of land and peoples through colonial science expressed how, as David Gilmartin has aptly observed, the British administrators and engineers conceived of ‘native’ communities as parts of the natural environment to be controlled (Gilmartin, 1999).

Territorialisation may define the land or environment in numerous categories, such as hydrological catchments, raw-material collection units, or forestry management districts. Hydraulic engineering, a form of environmental control and dominance, provides a fair illustration for the process of turning landscapes into knowable objects. Gilmartin (1994, 1995, 1999, 2003) has noted the effect of organising irrigation systems on indigenous community societies, where colonial British technocrats articulated a new set of water territories in the Indus Basin by erecting perennial canal systems in place of inundation canals. The effort not only gave a new order to the natural environment in Punjab and Sind provinces but also broke up and restructured the relationships within the network of local villages.

The theorisation of territory and territoriality, according to David Delaney, is a comparatively recent phenomenon. It entails the recognition of territoriality as an essentially contested (rather than an essential) concept, and as an approach it comprises a complex of ideas, images, and practices, and has largely developed since the 1970s. Partly the complexity of ideas within the field derives from its trans-disciplinary nature, with the meaning and significance of territory being strongly conditioned by the specific preoccupations of each respective discipline, such as political science, human geography, anthropology, sociology and psychology (Delaney, 2005: 34-35). Some works have been pursued to explore the possibility of territorial studies. For example, the work of Ismael Vaccaro (2007) explains how the process of territorialisation is ongoing into the contemporary era even in fully formed states. He illustrates how civil society, in his case in the Pyrenees, finds ways to reorganise by combining traditional technology with new political and economic frameworks to achieve local jurisdiction over local resources through a communal property system. Two of the most common issues relating to

¹⁴ It may thus be distinguished from the related term ‘imperialism’ which may be defined as the belief in, or desirability of acquiring colonies and dependencies, or extending a country’s influence through trade, diplomacy and other means for the purposes of warlike defence and internal commerce.

territorialisation in the literature are discussed below.

Territorialisation as Spatial Governmentality

The contemporary conceptions of territory-related issues, in the humanistic and social sciences are mostly inspired by the work of Michel Foucault which is sometimes refracted through political geographers. Therefore, it is natural that the knowledge produced tends to be highly focused on space and governmentality. Thus to understand the state of the field we must make a quick examination of Foucault's legacies on spatial theory as well as genealogical method, before this chapter turns its attention to the main themes of territorialisation. Foucault's work on territory is essentially subordinated to his studies of the logic of governmentality. He is concerned with a sovereign's legitimate dominion over a territory or more explicitly a space of competition between states (Foucault, 2000: 67-71). Stuart Elden and Jeremy Crampton endeavour to establish the relations between Foucault and geography as a discipline in the introduction of their edited contribution, *Space, knowledge and power: Foucault and Geography*, but Foucault's work actually was always filled with implications and insights concerning spatiality (Crampton and Elden, 2007). In his interview with Herodote called a 'Question on Geography' there is an earlier and brief outline of territory ideas. In this interview, which was undertaken in mid-1970s, Foucault made clear his meaning or implication of territory in reply to questioning about his profuse use of several spatial/geographical metaphors, such as displacement, domain, territory and so on. Among these clarifications of terms, Foucault demonstrated that:

'Territory is no doubt a geographical notion, but it's first of all a juridico-political one: the area controlled by a certain kind of power' (in Gordon ed., 1980: 67-68).

He constantly emphasises the spatiality of governmentality, thus the space on which the government conducts its operations and the rationalisation of space to enable those operations equals the extent of territory.

Territorialisation as Control Strategy-The View of Political Scientists

Territorialisation, though it is not their principal disciplinary concern, still arouses some interest amongst sociologists and political scientists who engage with studies of power, especially state power. However, what do the notions of territory, territoriality and territorialisation mean for these disciplines? The most popular current definition of territorialisation is the one we have already come across represented by the work of Nancy Lee Peluso and Peter Vandergeest in their *Territorialisation and state power in Thailand*, where territorialisation is primarily a people or resource control strategy (Vandergeest and

Peluso, 1995). The cooperation of Peluso and Vandergeest on the issues about states and forestry has lasted for more than a decade and produced a series of publications. Vandergeest and Peluso state explicitly that they find a basis for the analysis of territory in the work of political geographers. In addition, in the earliest of their series of works, they also elaborate territoriality as ‘the attempt by an individual or group to affect, influence, or control people, phenomena, and relationships by delimiting and asserting control over a geographic area’ which is directly drawn from the work of Robert Sack (Vandergeest and Peluso, 1995: 387-388).

At least three of Vandergeest and Peluso’s ideas about territorialisation are drawn from the work of Sack. They involve the meaning of territory, the features of it, and the practice of territorialisation. The first sense then of territory which is inspired by political geographers is as an abstract and homogeneous space defining states’ territoriality, which itself is seen as dependent upon modern mapping techniques to produce and conceptualise abstract space. Second, lived and experienced territory or space is not abstract and homogenous, but located, relative, and varied. Third, the study of territorialisation entails investigating the spatial organisation of administration within a state territory, rather than simply examining the distribution and variation of political institutions across space (1995: 385-391).

These territory-related concepts provide a basis for their subsequent work on state power and resource management, with special reference to forest and forestry originally based on Thailand, but later extended to Indonesia and Malaysia (Peluso, 1996; 2007; Peluso and Vandergeest, 2001; 2006a; 2006b). For example, Peluso and Vandergeest contend that the creation of ‘political forests’ (that is lands designated as subject to forest law) imposed immediate limitations on the possible forms of legal access to the newly constituted ‘forest ’resources, which now by definition belonged to the state. The pattern then was more than just accumulation by dispossession, but started with expropriation and then appropriation enabled through processes of de-territorialisation (the removal of local forms of tenure, knowledge and practice) and re-territorialisation (as an object of the states control). This pattern is the common thread in the genealogies of contests between political forest and customary rights in Indonesia, Malaysia, and Thailand. Territorial control functioned as a mechanism for resource or ‘species’ control. They further reassert and demonstrate the meaning and effect as follows,

‘Territorial control was the process by which governments demarcated specific territories as forest land, claimed all resources in these territories as state property under the jurisdiction of a forestry department or its institutional equivalent, and

patrolled this territory with forest guards and regular police or military personnel'
(Peluso and Vandergeest, 2001: 765).

Authorities territorialised power to achieve a variety of goals that Vandergeest and Peluso suggest included the need to make territorial claims, to protect resources, to collect taxes, to organise surveillance, and to gather information about the population (Vandergeest and Peluso, 1995: 390). However, the question arises as to whether this pattern applies equally in Japanese Taiwan and British Malaya? A *prima facie* look at the two case studies, with large forest areas, and differential systems of land tenure between forest and lowland, suggests similarities will exist. If so, which imperative was granted a special privilege over others in these cases? What was the logic of this preference?

In conclusion, the most simple and essential definition of territorialisation is the division of earth's surface into units. The creation of these units as objects of knowledge homogenises the actual environment by producing abstract space or spatiality. The nature of this spatiality is often overlooked in studies that tend to focus instead on the implementation and enforcement of power, rather than the territory itself. This may betray a tendency in many disciplines to intentionally, or more often unconsciously, equate concepts of space with the geography to which they refer. Therefore, this sort of work has paid less attention to the other aspects such as landscape, environment and so on, nor how they act in the accounts. It is no accident that territorialisation, for those who are interested in the issues of governmentality, is in nature 'spatial governmentality'. It is telling that one related term has emerged that attends to the intersection of environment and governance is ecogovernmentality or eco-governmentality. However, this term emerged from the broad field of political ecology and actually is more bound to environmentalism, rather than my focus in territorialisation.

This thesis challenges the existing spatial bias shown in territorialisation research and emphasises the role of the environment in disciplining, fostering, managing and monitoring the conducts of people and the liveliness of the land they inhabit, that disrupts and destabilises its categorisation. After all, the conduct of territorialisation does not take place in the air; its exercise is situated and locatable in real world. It is not only the social relationships and the histories of their interactions with the land that Vandergeest and Peluso study (1995: 389), but also the physical environments that play an actual role. In this sense many studies have acceded too readily to a constructivist stance, and we all too often have accounts that are, to coin a phrase, governance all the way down. Crucial for this thesis then is how the environment is 'framed' through a variety of representational

practices, technologies and devices.

Cartography

This thesis will attend to the preeminent role of cartography as the representational device framing the environment in territorialisation. Cartography has been intimately bound into the evolution of the state. It was one of the most critical means for the structural and ideological transformation of the mediaeval state into the modern territorialised state. Similarly cartographic representations of ‘environment’ in colonial territories were crucial in the constitution of notion of Empire.

In fact, the colonial activities of surveying and mapping were extensions of European state cartography and thus the genealogies of them as technologies of territorialisation extend back to the early modern period. David Buisseret locates some of the early developments of cartography as a means of enacting the state, by giving it territorial dimensions, in early modern France whose state cartography was one of the better developed. The French state initiated a thoroughgoing cartographic analysis of realm by Jean-Baptiste Colbert in the 1660s. Colbert became chief finance minister in France in 1661, at the beginning of the reign of Louis XIV. He, with assistants and successors, developed what would today be called a ‘base map’ of France, a sort of template upon which all manner of phenomena could be plotted: financial districts, religious jurisdictions, river-systems, and so forth. In this regard, for the government, realms came to be precisely defined by cartographic frontiers (Buisseret, 2003: 179-181).

In order to direct territorial expansion and exercise, from a distance, territorial control, the government needed to be kept informed of the progress of expansion and of the environment in which it occurred, through a range of maps. To meet the demand for administration, early modern states even called for the help from local esquires for the provision of maps but later more often relied on specific institutions. This evolving mapping practice expanded the authority’s control over land and people. In other words, map consciousness or cartographic literacy¹⁵, the ability to think cartographically and to prepare maps as a means of illuminating problems, had entangled the government with cartographic science gradually and tightly. For example, Peter Barber points that the English Crown had become one of significant patrons of cartography by the middle years of the sixteenth century. One of the Crown’s cartographic achievements was that the

¹⁵ The former term is borrowed from Peter Barber (1992, *England II: Monarchs, Ministers, and Maps, 1550-1625*), while the latter one inspired by David Matless (1999, *The Uses of Cartographic Literacy: Mapping, Survey and Citizenship in Twentieth-century Britain*).

English governance in Ireland (its first colony) had been strengthened through more detailed mapping of plantations, further planning against Spanish invasion and internal insurrections, and so on. Furthermore, by the 1560s, the government was no longer dependent on military engineers, or indeed on its own official servants, rather it enlisted well-educated and patriotic country squires (Barber, 1992: 59-62).

CONCLUSION- *Network-based Territorialisation*

Drawing inspirations from Political Ecology and Colonial Science approaches, a network-based 'Territorialisation' concept may be developed and then applied to an empirical study of environmental categorisation in Japanese Taiwan and British Malaya. To begin with, it suggests that the notion developed by Political Ecologists on the becoming of resources is a necessary focus. They are interested in exploring not only the dominant relationship of society over nature but also the 'production of nature' or 'nature as social product'. Political Ecology offers a useful perspective when looking into the process of contesting resource control. It reminds us of the importance of power. Thus, Noel Castree, for example, highlights the significance of the insights of Marxian political economy, which identify structured and consequential modes in the processes transforming the world (Castree, 2002: 141-142). The modes are strongly involved with how multiple socio-natural networks will be ordered.

Secondly, the colonial scientific work of land sub-division, including property, regulation, zoning and so on, speaks to the means of facilitating all industrial developments and the production of nature by colonial regimes. In addition, what I shall highlight is that large-scale entry of British capitalists into the Malayan plantation or mining and the Japanese mode of state-operated forestry in colonial Taiwan should not merely be read as merely economically dominated concerns or even as politically contested arenas for empires, though they were clearly both. More attention should also be drawn to the nature of colonial environments, including their physical settings and cultural underpinnings rather than seeing them as many studies, perhaps surprisingly seem to, passive contexts for the play of social actors.

In sum, this chapter has aimed to form a rather fresh approach by fusing Political Ecology and Colonial Science through the themes of colonial environmental demarcation. The thesis takes its inspiration from the concepts which those two theories suggest, such as power relations and network association. It takes them to point to the importance of the environment on the one hand but also its discursive shaping. It thus attends to materiality – of both discursive processes but also of the environment. However in reflecting on the way

nature is produced it seems to examine this through seeing how practices of territorialisation frame the world.

Chapter 3 Knowledge Exploration in (Pre) Colonial Taiwan

INTRODUCTION

Until the early twentieth century, Highland Taiwan had almost been a *terra incognita* for Chinese immigrants, European travellers, and Japanese administrators. Since the seventeenth century when immigrant adventurers began crowding into the Formosa island from south China, the long-term occupation by aboriginal people of the highlands had led to outsiders' unfamiliarity with this area. Further, the ethno-political statecraft employed by the Qing regime of China since the early eighteenth century discouraged the enhancement of knowledge regarding to the 'savage districts'. Therefore, not surprisingly, in the last quarter of the nineteenth century when the European enthusiasts attempted to collect and produce the modern geographical knowledge relating to Taiwan, they also felt frustrated with the forbidden status of highland Taiwan (Yeh, 2009). Eventually, the Japanese authorities triggered a series of exploratory activities and the hilly parts of Taiwan were increasingly made known to outsiders by their officers and engineers.

The imperial Japanese government annexed the island of Formosa in 1895, but the colonial authority there did not initiate its official administration in the highland part of Taiwan until the middle of the first decade of the twentieth century. This lack of immediate attention was down to two factors. On the one hand, the newly established Formosan Government had to deal with the resistance coming from the *Han* Chinese (漢人) who lived in plains during the first decade of colonial rule. Therefore the Government did not pay much attention to the affairs relating to hills and mountains, or the aboriginal people who had long lived there. On the other hand, the Government had scant knowledge about this politically and culturally isolated hilly area, owing to the lack of archival and field information. Due to the hard accessibility to highlands, as stated before, very few records written in Chinese and European languages were concerned about the *terra incognita* previously.

Although the main purpose of this chapter is to feature the Japanese conceptions on the Taiwanese environment, it is necessary to examine cognate Western exploration literature that was circulating at the time. The literal, pictorial and cartographical materials which the early Japanese intellectuals and officials inherited and based had the profound influence over the initial Japanese impressions of this island, even though the Japanese knowledge was finally constituted through undertaking a series of fieldwork explorations and surveys themselves. As Yeh suggests, the primary effect of the sparse information by the European explorers relating to Taiwanese geography, was not only to discourage the Japanese from

relying on existing accounts, but also to prompt them to conduct their own field surveys to deal with the gaps in the accumulated knowledge (Yeh, 2009: 61).

To demonstrate this, this chapter is divided into two parts tracing respectively the formation and operation of western and Japanese knowledge-producing networks, with reference to geographical or environmental perceptions. The first part of this chapter is concerned with the geographical conceptions built by the Europeans on the basis of natural historical interests. It explains that the influx of Europeans in the latter decades of the nineteenth century, mainly British, initiated the development of modern geographical knowledge relating to Taiwan. Secondly, this chapter examines the participating individuals and teams involved. It investigates the methodologies used by these pioneers and enthusiasts for perceiving and representing Taiwanese environments. Thirdly, it interrogates the kind of knowledge produced by these official or leisure tours. The latter part of this chapter, considers the conduct Japanese exploration of the island and how it could be seen as a prerequisite for effective colonial governance. Although still sporadic in nature, the footprints of Japanese civil administrators, military officers, and scientific experts had started to traverse the heartland and to extend to the east coast of the island. These Japanese actions not merely filled the spatial blanks which the Chinese and Europeans failed to fill but also displayed an attempt at a comprehensive understanding of the colonial territory.

Moreover, there was a considerable differences between the required information to satisfy the European interests in natural history and the Japanese imperatives for colonial rule of land and people. The former may be satisfied with knowing the mere distribution of objects and phenomenon in which they were interested, while the latter needed to know more about the value and accessibility of potential resources. Therefore, much more organised explorations and expeditions- undertaken by firstly the metropolitan scientific surveyors, then the local government teams- were despatched by colonial authorities to collect and manipulate field materials, and these subsequently produced constructive and practical knowledge. Such surveys were contested, and hostility and revolts by the aboriginal population obstructed the Japanese purposes and greatly confined the spatial extent of their surveys.

TREATY PORTS AND THE INFLUX OF WESTERNERS

*'Long as the island of Formosa has been known to navigators,
and though visited by Europeans centuries ago,
our knowledge of its geography at this period is exceedingly meager.'*

- Henry Kopsch, 1869

The reason why the Europeans had been enchanted by the island of Formosa for a long time may be demonstrated by Henry Kopsch, a British gentleman and F. R. G. S.¹⁶, in his statement as above. It chimed with his peers' eager interests in the geographical knowledge of Formosa in the latter parts of nineteenth century (Kopsch, 1869: 79). Formosa, the former title of Taiwan, was named by the Portuguese in the later part of the sixteenth century. Portuguese sailors were impressed by the lush primary forests in their western Pacific voyages which passed along the eastern coast of Taiwan island. Curiously, none of them ever stepped into this 'Ilha Formosa' which translates from the Portuguese as 'the beautiful island'. However, it is not surprising that there were still several expeditions or journeys undertaken mostly by Europeans and a few by North Americans and the Japanese, before the initiation of the formal Japanese administration. The results of their adventures were not only circulated contemporarily through numerous publications among the Anglo-phone and other European language academic spheres, but also inherited as the basis of the later Japanese knowledge about Taiwan. Therefore, it is constructive to look into the actions of Western adventurers before our attention is turned to their Japanese counterparts. Perhaps typifying these early encounters is the British explorer, Robert Swinhoe's claim in the mid-1860s that 'the mountain peaks are too multitudinous to enumerate, and the geography of the island too comprehensive to take into present consideration' (Swinhoe, 1864: 6). Perhaps because of this diversity and complexity, foreigners' desires to become better acquainted with the interior of this unknown island never weakened in the succeeding decades.

This section aims to examine the formation of pre-colonial geographical knowledge which was primarily the endeavour of Europeans on Formosa, as the results of this formation had influenced the Japanese environmental conceptions deeply. Examination of the archives reveals that there were considerable Western language citations in the critical and earlier Japanese accounts of Taiwanese geography, such as that by Ogawa. Completed in 1896, the second year of Japanese administration, Takudzi Ogawa's '*The Taiwan Isles*'

¹⁶ Fellow of Royal Geographical Society

(臺灣諸島誌) was the first major and general publication on the geography of Taiwan by Japanese. This representative gazetteer did not only provide the outline of Taiwanese lands and people but also summarises the extant Japanese knowledge about this island they had so recently annexed. For example, it shows how the ethnological concept that the Taiwanese aborigines could be categorised into four groups, namely *Paiwans*, *Amias*, *Tipuns*, and *Pepohoans*, was quite prevalent among the academics and authorities before the Japanese anthropological surveys were formally conducted. This classification which was created by George Taylor, one of the staff of the Chinese Customs Service, through his experiential tour (Taylor, 1889: 227-235), was not only cited in the *Taiwan Isles* but also quoted in ‘*Outline of Taiwan Industries*’ (臺灣產業略誌) compiled by the Secretariat to the Minister of Agriculture and Commerce (農商務大臣官房) and ‘*New Taiwan Gazetteer*’ (臺灣新地誌) which was a supplement to primary school textbooks (Takudzi, 1896: 144-165; the Secretariat to the Minister of Agriculture and Commerce, 1895: 28-30; Ishii, 1896: 10-12).

In this light, it is important to explore the Western literature, which the Japanese intellectuals and officials inherited and upon which they based their initial assumptions, because the nature of pre-colonial knowledge did affect and direct the colonial formation of Taiwanese environmental conceptions to some extent. This section cannot comprehensively examine all of the pre-colonial documents, but intends to pay special attention to geographical records of earlier periods which were made of mostly by Westerners and utilised by the Japanese. To sketch the pre-colonial knowledge on Formosa, this section outlines successively the formation and development of western knowledge producing networks, with special reference to the geographical or environmental perceptions.

The establishment of pre-colonial knowledge-creation networks in the late imperial Taiwan stems from the opening of treaty ports and is also a story about the influx of European aliens. In this light, this section reconstructs briefly the networks through which the Western contributors, especially the British pioneers, collected the landscape materials and circulated knowledge in relation to environment. The Tien-tsin Treaty (天津條約) of 1859, which was signed by the Qing (清) dynasty government of China with France and Britain, resulted in the opening of the coastal harbours in China. It is in accordance with Articles 8 and 11 of this Treaty that two ports in Formosa are declared open to foreign trade, and British subjects professing or teaching the Christian religion are free to go anywhere beyond, if supplied with passports counter-stamped by the local officials. The

first two treaty ports, *Tamsui*¹⁷ (or *Tamsuy* 淡水) and *Takow* (or *Takao* 打狗), which are located in northern and southern Formosa respectively, became the gateways into the island for Westerners. Shortly after, *Kelung* (or *Keelung* 基隆) and *Anping* (or *Amping* 安平) were also made accessible.

Varieties of foreigners with permission flowed into the island, as a result, including missionaries, naturalists, officials and tradesmen. Indeed, according to Yung-Hua Wu's work on the activities of Western exploration in the late Qing dynasty of the Chinese Empire, it is believed that dozens of foreign explorers made journeys into the enigmatic island of Formosa (Wu, 1999). Many of these explorers were (deputy) consuls or staff affiliated with the Imperial Chinese Customs Service in the treaty ports, while others were missionaries, usually based in English and Canadian Presbyterian missions stationed on the island. Selected stories of these individuals are stated and discussed subsequently. However, the area of the island which was toured by the strange outsiders had its spatial confines. The Westerners tended to travel largely, whether on official or amateur purposes, across the lowland countries. Very few people were able to undertake journeys into the highland parts of this island where were widely regarded as the 'savage districts' (番地) or 'savage territories'. The failure of most westerners to visit the savage districts owed to not only the inaccessible and precipitous mountains but also the fierce aborigines.

Dozens of western officials and missionaries resided in *Tamsui* or *Takow*, but as a study of their itineraries and logs shows, not all of them made any journeys around the rest of Formosa. Lieutenant Gordon was one of the first Europeans to explore Formosa in 1848. His purpose was to survey the coal mines in the north-eastern part of Formosa and to evaluate whether it was an ideal station site for fuel supply for the expanding, and increasingly coal based, British imperial fleets (Gordon, 1849: 22-25). Less than ten years after Gordon's arrival, Robert Swinhoe visited the island in 1857. Swinhoe's ambition, which was much more extensive than Gordon's, was not only to select the most prominent ports of the island for the British trade, but also to investigate the abundance of agrarian produce and forest resources within the hinterlands of these ports (Swinhoe, 1864: 15-18). These were to be the ports that were opened under the Tien-tsin Treaty of 1859.

Many of his documents contributed to the initial creation of knowledge about Formosa in the latter half of nineteenth century, so Swinhoe's work deserves further investigation. Robert Swinhoe (Plate 3-1), F. R. G. S., was not only the first western officer stationed in

¹⁷ In fact, there existed no unified format for Chinese script translation at that dates. For an honest representation, all place names and other words which were used by Europeans in the late imperial China would be kept.

the late Qing dynasty Taiwan, but also one of the pioneers in the arena of Formosan natural history prior to the arrival of the Japanese adventurers. He was born in Calcutta, India. There is no clear record of the date of his arrival in England, but it is known that he attended the University of London and in 1854 joined the China consular corps. Swinhoe began his official career in Taiwan as the vice consul in 1860, and then was promoted to the first consul stationed in this island in 1865. He finally departed from Taiwan when he was seconded as the deputy consul in Amoy in 1866. His work was significant in opening the island to the world by the publication of several important essays in the journals of numerous scientific societies.



Plate 3-1

Robert Swinhoe, the first western officer stationed in the late Qing dynasty Taiwan

Despite this, all three of Swinhoe's journeys were along the coasts of north-east and south-west Formosa, and limited to exploring only the accessible margins of these coastal lands. In addition to small-scale and coast-based fieldtrips undertaken by Swinhoe, he also derived some of his information from a Chinese-language source. The '*Gazetteer of Taiwan Prefecture*' (臺灣府志, *the Tai-wan foo-chi*), edited by Kung-Chhien Kao (高拱乾) in circa 1694, provided some of the primary materials that Swinhoe described. For

example, Swinhoe showed some animal species which could be seen in Formosa to the readers of the North China Branch of the Royal Asiatic Society (Swinhoe, 1865: 39-52). In his article titled as '*Neau-Shou 鳥獸*', *Birds and Beasts (of Formosa)*, Swinhoe indicated clearly the source of material that: *from the 18th chapter of the Tai-wan foo-chi, Statistics of Taiwan*. The information Swinhoe gathered and dispensed was of the greatest interest not only to his naturalist peers but also to experts of different origins worldwide. During his career, he published over one hundred and twenty articles on the zoology, geography and ethnology of Eastern and Northern China¹⁸ His work was referred to in numerous publications in the ensuing decades. For instance, when Henry Kopsch was making notes on the rivers in northern Formosa, he directed the readers to refer to the map attached in Swinhoe's essay of 1864 (Kopsch, 1869: 8; Swinhoe, 1864: 18).

The importance of Robert Swinhoe's work lies in the fact that he re-introduced the island of Formosa to the world after the opening of the treaty ports in the 1860s. Swinhoe inspired public interests in the island, as well as several explorations that succeeded him and expanded his work. The rich and varied fauna of Formosa, today also known in the West as 'Taiwan', as well as the relatively inaccessible circumstances of that time, were revealed in Swinhoe's series of notes and accounts pertaining to Formosa (Hall, 1987: 37). Although Formosa had been long recognised by the European sea navigators who sailed around the coast of West Pacific since the sixteen century, it was Robert Swinhoe re-opened this island to the world. Even though he suffered difficulties due to the frequently interrupted mailing service, he persisted in corresponding with some of the influential societies, such as the Royal Geographical Society, the North China Branch of the Royal Asiatic Society, and other organisations involved in natural history (Chang, 1994: 134-137). The following sections ask how the officers and missionaries configured the environmental impressions relating to Taiwan, as well as if their itineraries of these subsequent expeditions displayed some different patterns. Therefore, after explaining the influx of westerners in the latter decades of nineteenth century, this section continues to examine the formation of their knowledge producing networks with reference to the still existed travelling itineraries.

TRAVELLING TOPOLOGY MODELED BY NATIVE NETWORKS

The formation of environmental knowledge about Taiwan by the western pioneers in the late imperial period tended to entail one of the constitutive life experiences on this island,

¹⁸ The published writings of Robert Swinhoe could be accessed by [http:// home. gwi.net/ ~pineking/ RS/ MAINLIST. htm](http://home.gwi.net/~pineking/RS/MAINLIST.htm)

namely tour, visit or journey practices. The trails in this chapter have been compiled by analysing their itineraries. Table 3-1 summarises some of the key expeditions that succeeded Swinhoe's initial forays where records still exist. On the one hand, it indicates the travelling purposes of captains, consuls and clergy who left their footprints all over the island. On the other hand, this table also shows that who led the journey, as this demonstrates that their itineraries were designed not necessarily by those who wrote the accounts but could be determined by someone else and for other purposes— be they more senior foreigners, or indeed the often forgotten locals upon whose agency Western knowledge creation depended (Driver and Jones, 2009). Figure 3-1 illustrates the routes taken by the pre-Japanese Western explorers, and assists in identifying the places to which reference will be made. It is interesting but not surprising that the reasons why nearly most of the travelogues and accounts are produced for and in correspondence with the Royal Geographical Society. The reason is not only that the numerous Britons were most active among the foreigners in late imperial Taiwan but also these pre-colonial documents are preserved as they constituted the reference basis for the knowledge-shaping by their successors, namely the Japanese intellectuals and authorities.

Table 3-1 Extract of Western Explorations, 1860-1895

Name	Itinerary	Year	Purpose	Who led the journey	
Swinhoe	Trip ascending the Kelung branch of Tamsuy River	1857	Commercial survey which consists of visiting coal and sulphur mines, as well as selecting trade ports	Not stated	1
Swinhoe	North-East Formosa voyage of Kelung, Palm Island, Steep Island and Sawo Bay	1864	Exploration	Not stated	2
Swinhoe	South-West Formosa voyage of Takow, South Cape, Hongkong and Lungkeaou Bay, with one inland visit to Kalee tribe	1864	Make enquiries about the supposed wreck of the nearby at South Cape	Chinese settler	3
Collingwood	A boat Journey across the Northern End of Formosa, from Tam-suy, on the West, to Kee-lung, on the East; With Notices of Hoo-wei, Mangka, and Kelung,	1866	Leisure trip	Chinese servants	4
Hughes	Visit to Tok-e-Tok, Chief of the Eighteen Tribes, Southern Formosa	1867	Rescue castaways of shipwreck junk, chartered by Messrs. Millisch and Co., of Tamsui.	A young Chinese acted as his escort to the savage territory	5

Table 3-1 Extract of Western Explorations, 1860-1895 (Continued)

Name	Itinerary	Year	Purpose	Who led the journey	
Kopsch	Trip ascending the Kiang-pih (Kieng-bay) and To-ka-ham branches of Tamsui River	1867	Exploring some of the affluents of the stream known as the Tamsui River, which debouches into the sea at Hu-wei (Tamsui).	Chinese owner of a boat	6
Thomson	A journey in southern Formosa	1871	Obtaining a collection of photographs of, and exact information regarding, the people and provinces visited	Hired six Baksa Pepohoans as bearers of my instruments and baggage	7
Bax	A trip from Takow to Ling-a-leau, Pethou, Hoeng-sia, Baksa, Ka-ma-na and A-lu-kan	1871	Visit a village inland where lies a small Christian community of Peppohoans	Rev. H. Ritche of the London Presbyterian Mission Society	8
Bax	Expedition to Mount Sylvia	1872	Visit Mackay's mission stations and intend to ascend Mount Sylvia, but failed finally	Mackay of Canadian Presbyterian Church	9
Bullock	A trip into interior of Formosa, with special reference to Po-sia	1873	In accompany with Campbell to visit his native converts	Campbell and his baptised Pepohoan fellows	10
Corner	Journey in the interior of south Formosa	1875	Making some notes and sketches of the country occupied by the Aborigines (Accompany by Dr. Krauel, German Consul at Amoy) Calipo and Kao-siah	Not stated	11
Allen	A Journey through Formosa from Tamsui to Taiwanfu	1875	Visit the mission stations with Mackay and Ritchie	Mackay and Ritchie	12
Beazeley	Overland journey through the southern part of Formosa, from Takow to the South Cape	1875	Visit the South Cape, select a site for the lighthouse and obtain the necessary piece of land from the aborigines for the Chinese Imperial Maritime Customs	Several Mandarins (i.e. Chinese officials)	13
Corner	A tour through Formosa, from south to north	1876	To see something of the other tribes of aborigines, some of whom I described in a journal of my visit to the south in the early part of the year	Chinese burden bearers who act as guides and two Pepohoans guides live at Lai-sia	14
Hancock	A visit to the savages in the south suburb of Tamsui,	1881	To see something of aboriginal tribe in Kotchou vicinity	Chinese interpreter	15
Taylor	A ramble through south-eastern Formosa	1887	Leisure trip	Not stated	16

Source:

1 Swinhoe, Robert 1858, Narrative of a Visit to the Island of Formosa, *Journal of the North China Branch of the Royal Asiatic Society*.1(2):145-164; Swinhoe, Robert 1864, Notes on the Island of Formosa, *Journal of the Royal Geographical Society of London*, 34: 6-18.

2 Swinhoe, Robert 1865 – 1866, Additional Notes on Formosa, *Proceedings of the Royal Geographical Society of London*, 10(3): 122-128.

3 Swinhoe, Robert 1865 – 1866, Additional Notes on Formosa, *Proceedings of the Royal Geographical Society of London*, 10(3): 122-128.

4 Collingwood, Cuthbert 1866 – 1867, A Boat Journey across the Northern End of Formosa, from Tam-suy, on the West, to Kee-lung, on the East; With Notices of Hoo-wei, Mangka, and Kelung, *Proceedings of the Royal Geographical Society of London*, 11(4):167-173.

5 Hughes, Thomas. F. 1871 – 1872, Visit to Tok-e-Tok, Chief of the Eighteen Tribes, Southern Formosa, *Proceedings of the Royal*

Geographical Society of London, 16(3): 265-271.

6 Kopsch, Henry 1869 -1870, Notes on the Rivers in Northern Formosa, *Proceedings of the Royal Geographical Society of London*, 14(1): 79-83

7 Thomson, John. 1872 – 1873, Notice of a Journey in Southern Formosa, *Proceedings of the Royal Geographical Society of London*, 17(3): 144-148; Thomson, J. 1873, Notes of a Journey in Southern Formosa, *Journal of the Royal Geographical Society of London*, 43: 97-107.

8 Bax, Bonham Ward 1875, *The Eastern Seas: Being A Narrative of the Voyage of H. M. S. "Dwarf" in China, Japan and Formosa*, London: John Murray.

9 Bax, Bonham Ward 1875, *The Eastern Seas: Being A Narrative of the Voyage of H. M. S. "Dwarf" in China, Japan and Formosa*, London: John Murray.

10 Bullock, T. L. 1877, A Trip into the Interior of Formosa, *Proceedings of the Royal Geographical Society of London* 21(4): 266-272.

11 Corner, Arthur 1874 - 1875, Journey in the Interior of Formosa, *Proceedings of the Royal Geographical Society of London*, 19(7): 515-517.

12 Allen, Herbert J. 1877, Notes of a Journey Through Formosa from Tamsui to Taiwanfu, *Proceedings of the Royal Geographical Society of London* 21(4): 258-266.

13 Beazeley, M. 1885, Notes of an Overland Journey Through the Southern Part of Formosa, from Takow to the South Cape, in 1875, with an Introductory Sketch of the Island, *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, New Monthly Series, 7(1): 1-23.

14 Corner, Arthur (1877 - 1878)1877, A Tour Through Formosa, from South to North, *Proceedings of the Royal Geographical Society of London*, 22(1): 53-63.

15 Hancock, William 1885, A Visit to the Savages of Formosa, *Good Words*, 373-379.

16 Taylor, George 1887, A Ramble Through Southern Formosa, *China Review*, 16.

Through an examination of the itineraries in Table 3-1, at least two notable features become evident. Firstly, (Deputy) Consuls, staff of H.M.S. and Presbyterian missionaries made their journeys with the purposes of official inspection or leisure interest. For example, in the summer of 1881, M. Michael Beazeley made the journey as part of his duties whilst in the Department of Works in the Chinese service, and engaged in putting up lighthouses. The object of the journey was to visit the South Cape, select a site for the lighthouse and obtain the necessary piece of land from the aborigines for the Chinese Imperial Maritime Customs (Beazeley, 1885: 5). While later in 1886, George Taylor, who was stationed in Imperial Chinese Customs Service, visited the South Cape. In these leisure trips made by Taylor, he not only made observations and recorded them, but also collected some folk-tales from the *Botan* tribe (Taylor, 1887: 139-153).



Figure 3-1 Field sites and routes of Western exploration up to 1895, Compiled by the author

Secondly, it is apparent that the Westerner's travelling topology was erected by means of a native network. Due to the unfamiliarity of the physical environments and local conditions in Formosa, the visits of European explorers usually began with the hiring of natives as servants, porters and interpreters. As Kopsch admitted in his journey notes of the *Tamsui* River watershed located in northern Formosa: 'owing to the presence of a hostile race of savages throughout the island, who glory in the murder of Chinese, and since in these latitudes it is difficult to travel without such assistance, one is debarred from penetrating the interior' (Kopsch, 1869-1870: 79). The reluctance of local guides to take Europeans into the interior and fears about these 'hostile savages' confined the expeditions across Formosa to the specific spatial areas. In other words, these enthusiastic travellers usually followed the social linkages which had been established by the *Han* Chinese or *Shou-fan* (熟番). This was the case with both short excursions and long overland journeys around the island.

In the lowland countries, the *Han* Chinese at times acted as the porters and guides for European travellers, while the 'Mandarin road (官道)¹⁹', which was established for government administration as well as for linking the chief towns in the western lowlands and hills of Taiwan, was taken for granted as the main boulevard from south to north. For example, except for the interior parts of their journeys, the expeditions by T. L. Bullock (1873), Herbert J. Allen (1875) and Arthur Corner (1876) proceeded for the most part along the Mandarin road. In the borderlands between the 'savage districts' and the *Han*-dominated area, *Han* interpreters or local elites who were familiar with aboriginal affairs were enlisted. These interpreters had an intimate knowledge of the aboriginal language, which was critical in dealing with local inhabitants. Through the use of such guides, Robert Swinhoe (1864) and William Hancock (1881), for example, were introduced into the *Paiwan* aboriginal village in south Formosa and the *Taiyal* tribe in the south suburb of *Tamsui* respectively (Table 3-1).

Moving eastward to the periphery of the 'savage territories', the *Shou-fan* aborigines were employed in the same roles as the *Han* Chinese in other parts of the island. The 1873 journey into the *Po-sia* (埔社) (Steere, 1874; Bulluck, 1877) provides a good example to demonstrate that most of the Western travellers followed the trajectory previously pioneered by missionaries, and most of these tracts were made accessible by the use of the local network of *Shou-fan*. *Po-sia* is a great basin which is surrounded by hills and

¹⁹ The term 'Mandarin road' was contemporary usage and could be seen in Arthur Corner's tour account (1877-1878), *A Tour Through Formosa, from South to North*, *Proceedings of the Royal Geographical Society of London*, 22(1): 55, 59.

mountains and lies near the heart of Formosa. The 'Po-sia Trip' route eventually became one of the most popular 'Interior package tours' among European and American visitors. However, according to the documents still in existence, only eight foreigners had ever visited the interior district of central Formosa before the year 1895, namely William Campbell, T. L. Bullock, Joseph Steere, Arthur Corner, Dr. Krauel, Herbert J. Allen, George Leslie Mackay and Hugh Ritchie (Table 3-1). The first trip by Reverend William Campbell to *Po-sia* was made in November of 1872 (Campbell, 1889: 258-274). This was a missionary excursion, which was directed by local inhabitants who had been newly-baptised as Christians of *Shou-fan* aborigines. The journey commenced at *Toa-sia* (大社), travelling through *Lai-sia* (內社), across many precipitous ravines and ridges, finally arriving at several hamlets in *Po-sia*, including *Gu-khun-soa* (牛眠山), *O-gu-lan* (烏牛欄) and *Toa-lam* (大瀾). Almost one year later, Campbell made his third journey to *Po-sia* with Bullock, who was British Acting Assistant Consul to Taiwan, as well as Joseph Beal Steere, who was a Collector in Natural History for the State Museum of Michigan, United States.

On 14th of October, 1873, Bullock and his company left *Taiwanfoo* (臺灣府 or *Taiwanfu*) and travelled for three days northeast. On the fourth day they travelled east for one and a half days to *Tsui-sia-hai* Lake (Lake Candidius). Another day's march north from that lake of *Tsuisia* brought them to the valley of *Po-sia* or *Polisia* (埔裏社). They stayed in *Po-sia* for a fortnight, during which time Bullock made a three-day trip to the country of the *Chhe-hwan*²⁰ natives. In this trip to the lands east of *Po-sia*, the exploration team was guided by a *Shou-fan* named *Atun*. From *Po-sia*, they travelled west two days to *Chang-wha Hsien* (彰化縣). There, Bullock left his companions after one day and travelled alone to *Taiwanfoo* (Bullock, 1873: 395).

George Leslie Mackay, who was a Canadian Presbyterian, was based in the vicinity of Tamsui. Not only was he pleased to offer assistance to western travellers, but his residence also became the starting point or destination of many of their journeys. For example, Joseph Steere and Herbert J. Allen who was the British Acting Vice-Consul at Tamsui, were the guests of Mackay. In addition, Mackay invited Bonham Ward Bax and Allen to visit his mission stations in 1872 and 1875 respectively (Bax, 1875: 116-135; Allen, 1877: 259).

Another example is the journey made by Dr. James Laidlaw Maxwell, who was famous for directing the expedition by John Thomson into the eastern district of *Taiwanfoo*. In

²⁰ *Chhe-hwan* (生番), also Fukien dialect, meant *Shen-fan*.

1865, Dr. Maxwell, a graduate of Edinburgh University, became the first English Presbyterian missionary to practice medical and missionary work in Formosa, having arrived at the southern side of the island. Shortly afterwards, in 1870 and 1871, he promoted the foundation of four gospels at *Baksa* (木柵), *Poah-be* (拔馬), *Kong-a-na* (岡子林) and *Kam-a-na* (柑子林) respectively (Band, 1972: 75-76; 82-84), all of which are some twenty miles east of *Taiwanfoo*, and all belonging to the *Shou-fan* tribes of the *Siraya* race. John Thomson, another participant of this eastern *Taiwanfoo* journey, who was a photographer and also a F. R. G. S., was born in Edinburgh in 1837 but travelled across East and Southeast Asia from Ceylon, Malay Peninsula, Siam, Cambodia, Macau, Hong Kong, Amoy, Formosa to China since 1860s (John Thomson's obituary, 1921: 470). He recorded his journeys by camera and published the results as '*Illustrations of China and its people: A series of two hundred photographs, with letterpress descriptive of the places and people represented*' (Thomson, 1873) which are valued by both past and current scholars. In April of 1871, John Thomson became acquainted with Dr. Maxwell at an encounter in *Amoy* (廈門), *Fukien*, south China, and was invited to make a journey to Formosa by Maxwell, perhaps due to their shared Edinburgh origins. In a similar vein to the *Po-sia* expeditions, all but one month of Thomson's itinerary in Formosa was scheduled by Maxwell, according to his own account (Thomson, 1872).

One conclusion that can be drawn from these examples is that most of the travelling routes made by Western explorers were suggested, and even dominated, by the European and North America missionaries. It was apparently impossible to undertake unaccompanied or casual overland journeys in Formosa because of a lack of familiarity among outsiders and the many restrictions they encountered.

RESTRICTED SPATIAL EXTENT AND LATERAL GEOGRAPHICAL IMAGES

Control of access to inland and field sites led to limited observation and discouraged the becoming of resources. The historic accounts, which were published in those journals and magazines mentioned above, focused upon descriptions of flora, fauna and folklore, but also provided a window into the island's physical and human geography. The case of Taiwan echoed what Fa-Ti Fan observes in his study of the progress of Western natural history in the nineteenth-century Qing China, as well as accompanying or serving the interests of the commercial activities and imperial expansion. Fan claims that the natural life of China presented by the Western natural historians was highly determined by the restricted field sites, which were also connected to the geography of commerce. For

example, because travellers were restricted to places such as treaty-ports, these also became the places in which naturalists built their collections. Thus, the markets selling domestic produce and herbal stores became their field sites (Fan, 2004). In effect, many of the field sites were markets, not natural settings, and collection depended upon indigenous trade routes and categorisations. By the late nineteenth century, Taiwan, especially 'Highland Taiwan', was not open to anyone who wanted to enter it, even though there was potential in forest and mineral resources there, such as camphor extracted from trees or petroleum beneath the land surface. For example, Swinhoe enabled the world to become aware of the timber wealth of Taiwan (Swinhoe, 1864: 17-18). John Dodd, another active British tradesman, pointed out the existence of petroleum in central Taiwan, stating that *I discovered the petroleum wells in 1865 on my first visit to the lofty mountains, soon after named the Sylvian range, and the Dodd or Western range* (Dodd, 1895: 556).

Until the establishment of the formal Japanese administration, the relative inaccessibility of Highland Taiwan and the east coast of the island still resulted to the lack of the outsiders' knowledge to the '*terra incognita*'. It is partly due to ethno-political conditions and partly for physical difficulties. As stated above, passionate missionaries and ambitious consuls used their local networks of natives, both Chinese residents and the *Shou-fan* aborigines, in order to wander across the lowland plains of Formosa. However, it appeared in no highland tours in any sense. The so-called interior journeys which the explorers claimed are actually piedmont excursions around the lower hills that were no higher than one thousand metres at the most. Even so, Beazeley argued that since the island was '*opened by the Treaty of Tientsin to foreign commerce in 1860, it should by this time have been thoroughly explored; whereas we know almost nothing of the interior, the range of mountains, and the east coast*' (Beazeley, 1885: 1-2).

As a consequence of this temporal-spatial context, the Qing regime of statecraft and contemporaneous ethno-politics (Shih, 1990; Ka, 2001), the 'savage districts' had become the forbidden area of Taiwan for outsiders. It remained the preserve of indigenous inhabitants from the early eighteenth century throughout the end of Qing dynasty (1895). Although the borderline of the 'savage districts' was not fixed and had been moved eastward several times due to the invasion of the *Han* Chinese, its effect was to restrict movements of people within the island and to ensure separation between the Chinese and indigenous groups. The Government forbade their people to cross the boundary of 'savage districts', which was well defined by this time. Beyond this line no *Han* Chinese was allowed to enter the 'savage districts' and no *Shen-fan* (生番) were permitted to enter the lowland plains without official permission. Of course, Western explorers were not the

exception to this rule.

Not only the Qing government, but also the westerners were quite unfamiliar with the conditions and affairs in the ‘savage districts’. In the historical background stated above, the Chinese Government expressed little interest in improving their knowledge of Taiwan highlands until the 1870s. However, following the Japanese expedition against the *Botan* tribe (or *Botan* 牡丹社) in the south part of the island in 1874, the Chinese officials altered their policy, largely as a result of finding themselves looked on as authorities of the whole island by the Japanese, and took active steps to govern this part of territories. However, the Qing government in Taiwan still possessed little knowledge and that which they had was confined to specific areas until the Japanese government assumed control of Taiwan.

Accordingly, these sorts of geographical images, which are derived from the Westerners explorations as well as political and economic reports, are unilateral and fragmented. Indeed, this is partly because Admiralty charts seemed to be the only available cartographical basis when these British outpost officers and stationed missionaries undertook their field trips. From the accounts of Robert Swinhoe in the mid nineteenth century to the description of William Campbell at the end of nineteenth hundreds, they not only depended upon Admiralty charts for the base reference for their respective itineraries but they also formed the basis for calculation of length, width and the area of Formosa Island (Swinhoe, 1858; 1864; 1865-1866; Campbell, 1896).

The progress of outsider’s geographical knowledge on Taiwan was not quick but it was steady. The environmental conceptions featured the comparatively detailed seashore line, the lower-course streams, the densely-populated towns and the imagined arrangement of the mountain ranges (Figure 3-2 & Figure 3-3). In addition, the westerners had nearly no knowledge about the central and eastern parts of the island, namely highland Taiwan or the ‘savage districts’. It is clear that the areas mentioned above were almost blank in the maps which were compiled by Admiralty or custom services. This was exemplified by the physical descriptions of Formosa by Alexander Hosie, who was Acting Consul at *Tamsui*.

After nearly forty years of fieldtrips overland in Formosa, the original depictions of Taiwan as *terra incognita* were gradually being filled, but European intellectuals such as Hosie still failed to construct a complete physical geography of the island until the mid-1890s. The understanding of environment inevitably focused on the areas with economic and political significance. In a commercial report presented to Britain’s Parliament in 1893, Hosie claimed that ‘Its geological formation has, to a certain extent, been ascertained’. However, he added that ‘the composition of the high axial range which runs from north to south through the eastern half is still imperfectly known’. He presented

a one-page sketch of the geography of northern Formosa, which occupied the most productive districts exporting tea and camphor. Also, it possessed the highest commercial importance of the island to the British Empire. Both of the waterways of lower *Tamsui* Valley and the harbour of *Kelung*, which are situated at the north Formosa, are also detailed in the section of 'Physical Characteristics' (Hosie, 1893: 4-7).

Both of these two aforesaid maps, Figure 3-2 and Figure 3-3, were presented by resident Consuls, but on different occasions. The former was an illustration enclosed in the journal of Royal Geographical Society by Robert Swinhoe (1864), while the latter was attached in a report to Parliament by Alexander Hosie (1893). Both of them were compiled on the basis of Admiralty Charts, thus the accuracy and recentness of most outline information may be accepted as satisfactory. Most information on the interior would be appreciated in a scientific manner. For example, the words printed on the 1864 sketch map demonstrate the selection of new discoveries. The coast from *Kok-Si-kan* to *Ta-kau-kon* has been inserted from a partial survey by Mr Richards. As it is uncertain how far re-correction extends, the coast north is left according to the former imperfect Charts (Robert, 1864: 6-7).

Apart from the subjective description of physical features relating to Taiwanese geography, numerous records about the human landscapes appeared as well. Typical scenery, on the one hand, in the countryside was at all times depicted in traveller journals. For example, Henry Kopsch stated that *Ku-lun-an* is a picturesque little village situated on the left bank, and is surrounded by clumps of feathery bamboos. The neighbourhood was richly cultivated with sugar-cane, hemp, and vegetables, and considerable boat traffic was observed on the river (Kopsch, 1869: 80). Other industrial landscapes were also stated, such as Taylor's remarks. 'Northern Formosa is comparatively hilly, but large areas are covered with tea plantations, which form the principal industry' (Taylor, 1889: 225). On the other hand, stepping into the 'savage districts', the exotic folklore of aboriginal inhabitants became the themes of documents. George Taylor's ethnographical classification of Taiwan aborigines, which was presented at the Geographical Section of the British Association at Bath, in September of 1888, could be listed as one of earlier and scientific sub-division of aborigine concepts. Those inhabitants of Formosa who have so preceded the Chinese, and others who in point of priority of arrival in the island are entitled to be termed aborigines, may be divided into four divisions—the *Paiwans*, *Amias*, *Tipuns*, and *Pepohoans* (Taylor, 1889: 227). Although this sub-division was incomplete, it was clearly distinguished from the traditional Taiwan aboriginal discourse based on tribe or community.

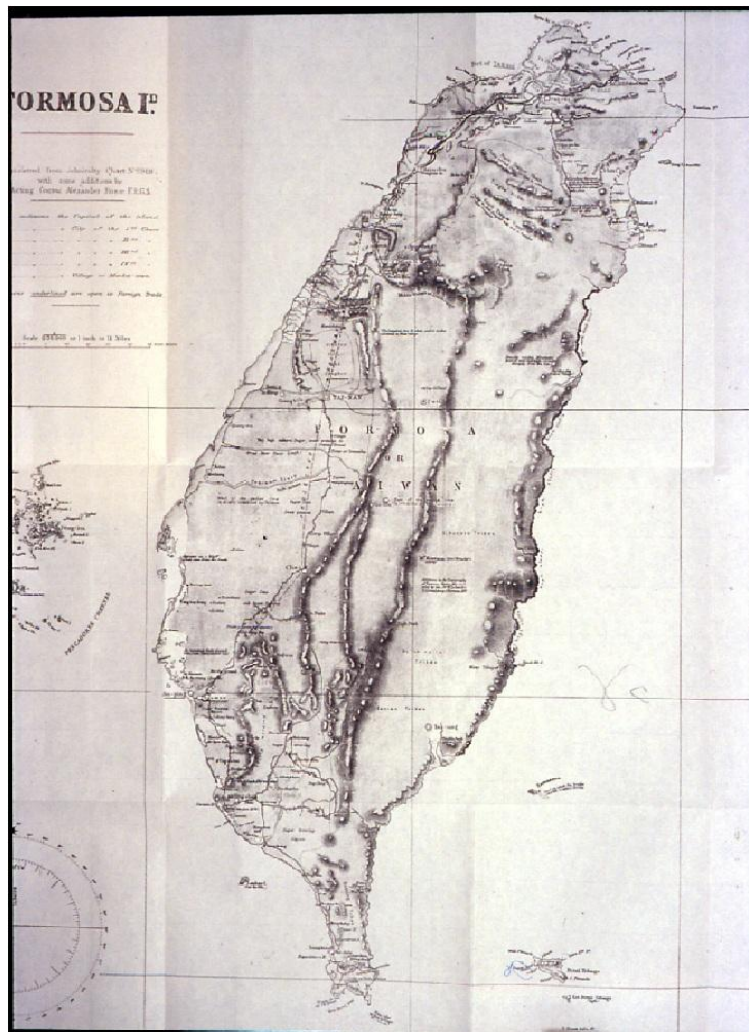


Figure 3-2 British Knowledge on the island of Formosa in the 1860s. (Swinhoe, 1864)

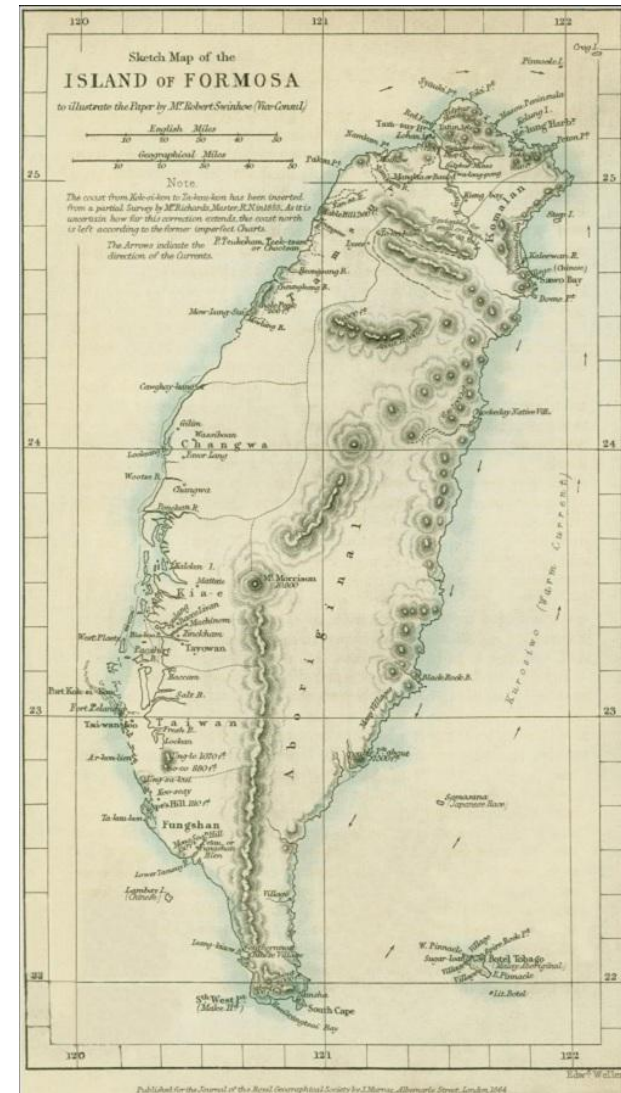


Figure 3-3 British Knowledge on the island of Formosa in the 1890s. (Hosie, 1893)

Nevertheless, the specific and concentrated journeys of Westerners would be responsible for their distorted geographical knowledge of Formosa. Due to the small numbers of Japanese who had ever visited Formosa, what we could expect is that the intentional preference of the European and American actors that time may help to shape the Japanese successor's knowledge of Taiwan in the following decades.

We could conclude from the first part of this chapter that the lateral and partial geographical knowledge constructed by Europeans prevailed before the commencement of Japanese administration. The Japanese were obviously disappointed with the textual and pictorial source of materials contributed by Europeans, but it was evident that the new generation of Japanese intellectuals preferred the Westerners' documentation to the Chinese records. Therefore, the publications of Western institutions and societies were popular and easily accessible not only for European academics and populace but also the young Japanese scholars who were highly interested in the knowledge about Taiwan. One of the representative contributions by Takudzi Ogawa will be discussed in more detail later in the chapter. However, what I need to stress is that: an examination of the materials shows that the spatial extent of these Westerners' cruises was highly restricted to the west part of the island, specifically the hills and plains. It also shows that their interests focused mainly on physical characteristics, aboriginal inhabitants, and industrial landscapes.

The restricted geographical knowledge resulted from the spatial network of information production and circulation. It was through the specific networks, woven from the historical events and social situations, that the Taiwanese environmental knowledge, which was accepted by the modern geographic spheres, was initially created. These interlinked but sometimes separate networks include at least *collecting* and *circulating* networks. The former networks were constructed by the long-stay missionaries who produced by-products with their religious work and the short-term stationed officers who kept journals for their official or leisure tours respectively. The activities and the roles of some key figures are difficult to be ignored in the network of knowledge collecting and circulating. Take William Campbell for example, the 1873 *Po-sia* journey was impossible if he failed to construct a bridge between the natives and his fellow travellers. In addition, it would be of insufficient if the lack of this long-resided missionary's geographical account, *The island of Formosa, Its past and future* (1896) in the Royal Scottish Geographical Magazine. However, the circulating associations are rather difficult to construct, because the available materials are refined. We are only aware of that the Britain-based geographical knowledge reporters at all times submitted their descriptions and addressed their field experiences

mostly in the Royal Geographical Society of London or less frequently the Royal Asiatic Society (North China and Straits branches²¹).

INHERITED JAPANESE KNOWLEDGE FROM THE WESTERNERS

「臺灣島新に我版圖に入れりと雖も、地理の探究全く未だ行はれず
島の一半即ち蕃人の住する地方は 猶最闇黒の阿弗利加の如く、猶地球に向はざ
る月球の半面の如し、他の一半即ち支那人の住する地方に至りても 亦た憑據す
べき材料に乏しく、鞆を隔て、搔くの憾多し、臺灣諸島の經營は朝野の大問題
なるに、其基礎たるべき地理上の智識此の如きは闕典と謂はざる可らざるなり」

—小川琢治

The island of Formosa was incorporated into our nation's territory, but the geographical exploration of it has not been put into practice until now. On the one hand, the districts occupied by the Savages are as the Dark Continent of Africa or could be analogised as the opposite of the moon shadowed by the earth. On the other hand, the credible materials regarding the country resided by the Chinamen are not available. In spite the fact stated as above, as the development and management of Formosa as well as its neighboured islands have engaged the attention of whole Japanese nationals increasingly, one volume of geographical knowledge which is worth referencing would be appreciated-

*Takudzi Ogawa.*²²

The utilisation and exploitation of resources in colonies based on the knowledge about the environment in ruled territories. The formation and circulation of knowledge was usually made by networks. The decisive networks in early Japanese Taiwan were actually constituted by a smaller group of individuals. The purpose of this section is to reconstruct the networks of environmental knowledge-production which were formatted by the Japanese during its early administration in Taiwan.

Until the early twentieth century, highland Taiwan had almost been a *terra incognita* for Chinese immigrants, European travellers, and Japanese administrators. Since the seventeenth century when immigrant adventurers began crowding into the Formosa Island from south China, the long-term occupation by aboriginal people of the highlands had led to outsiders' unfamiliarity with this area. Further, the ethno-political statecraft employed by the Qing regime of China from the early eighteenth century to control the ruled peoples discouraged the enhancement of knowledge regarding to the 'savage districts'. Therefore,

²¹ For example, John Dodd's 1882 article 'Probable Origin of the Hill Tribes of Formosa', *Journal of the Straits Branch of the Royal Asiatic Society*.

²² Takudzi Ogawa, 1896: introduction.

not surprisingly, in the last quarter of the nineteenth century when the European enthusiasts attempted to collect and produce the modern geographical knowledge relating to Taiwan, they also felt frustrated with the forbidden status of highland Taiwan. Eventually, the Japanese authorities triggered a series of exploratory activities and the hilly parts of Taiwan were increasingly made known to outsiders by their officers and engineers.

Due to the hard accessibility to highlands, very few records written in Chinese and European languages were concerned about the terra incognita. The imperial Japanese government annexed the island of Formosa in 1895, but the colonial authority there did not initiate its official administration in the highland part of Taiwan until the middle of the first decade of the twentieth century. This lack of immediate attention was down to two factors. On the one hand, the newly established Formosan Government had to deal with the resistance coming from the *Han* Chinese who lived in plains during the first decade of colonial rule. Therefore the Government did not pay much attention to the affairs relating to hills and mountains, or the aboriginal people who had long lived there. On the other hand, the Government had scant knowledge about this politically and culturally isolated hilly area, owing to the lack of archival and field information.

The literal, pictorial and cartographical materials which the early Japanese intellectuals and officials inherited and based had the profound influence over the initial Japanese impressions of this island, even though the Japanese knowledge was finally constituted through undertaking a series of fieldwork explorations and surveys themselves. It is therefore necessary to examine cognate Western exploration literature that was circulating at the time. As Takudzi Ogawa (小川琢治) suggested in his statement above that the Japanese intellectuals generally thought that geographical explorations were emergently necessary, partly because the districts occupied by the aborigines are virgin lands which no man had accessed, partly for the credible materials regarding the country resided by the Chinamen are not available. Also Er-Jian Yeh suggests that the primary effect of the sparse information by the European explorers relating to Taiwan geography was not only to discourage the Japanese from relying on existing accounts, but also to prompt them to conduct their own field surveys to deal with the gaps in the accumulated knowledge (Yeh, 2009: 61-62). The field observations which Europeans and Americans have made assisted in corroborating the previous information on Taiwan. Obviously, the impressions the fieldworkers, such as Michael Beazeley (1885), George Taylor (1887; 1889), and Alexander Hosie (1893), had conveyed were the complete unfamiliarity with the Highland Taiwan and the east coast countries of the island. For example, it is not difficult to indicate the high similarity between the island of Formosa (Figure 3-3) which was presented by a

British Acting Consul, Alexander Hosie in 1893 and the Taiwan Isles Map, 1895 (Figure 3-4). In fact, the latter is really a mere Japanese edition of the former. The words demonstrating the distribution of resource, such as cane-sugar production districts and camphor trees cluster areas, were translated directly into Japanese words. Naturally, the limited Taiwan knowledge of Westerners which is stated in the immediately past section leads to the deficiency of Japanese ones. As Ogawa's words in the introduction of his book *'The Taiwan Isles'* (臺灣諸島誌) suggests that there had existed two worlds in the tiny but complex island of Formosa.

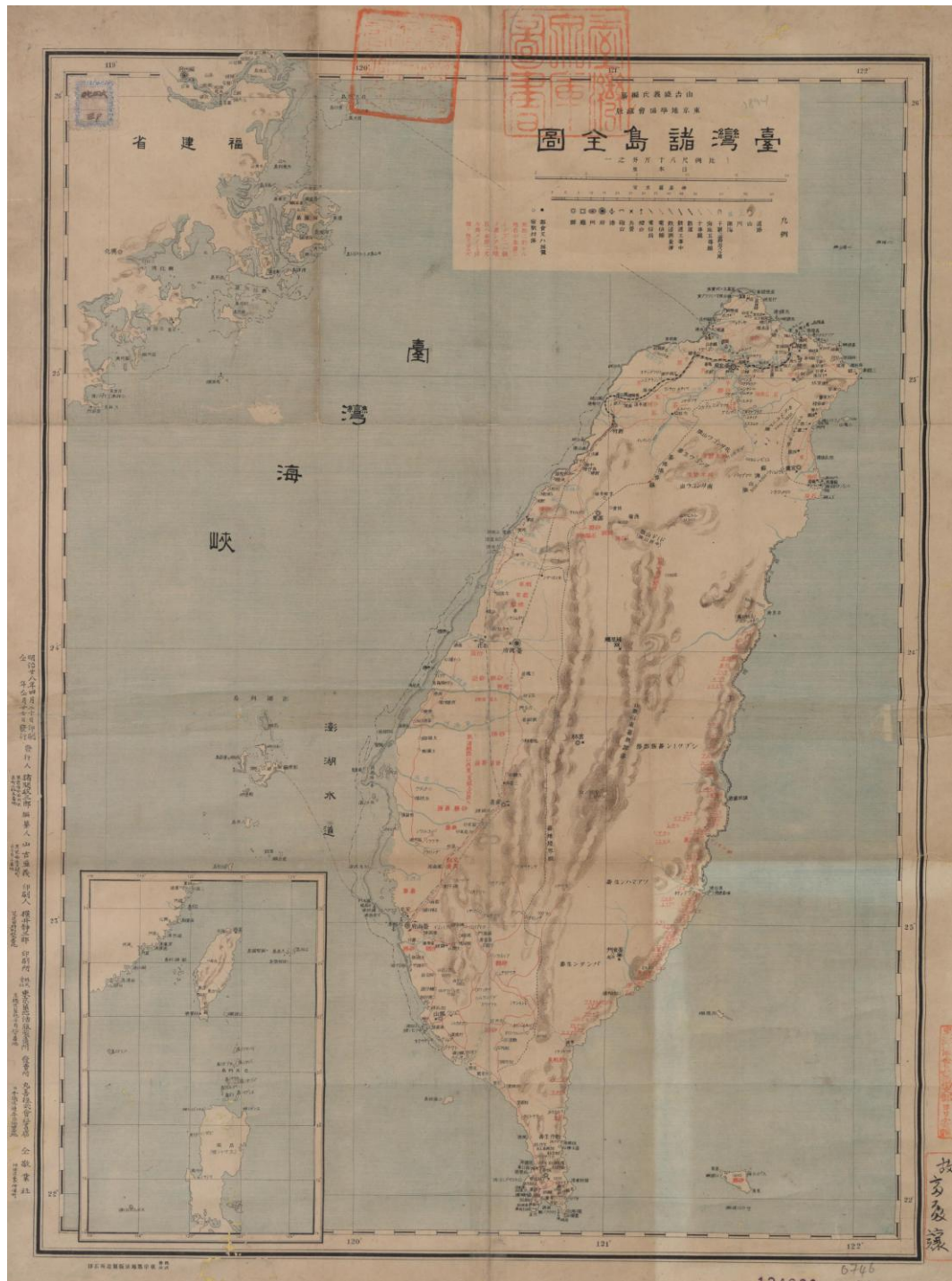


Figure 3-4 Taiwan Isles Map, 1895 (Yamayoshi, 1895)

After the annexation of new territory, the members of Japanese academies expressed their interest eagerly to all possible issues about Taiwan. The Japanese intellectuals invested ardent hopes in broadening their understanding of Taiwan environments. The change of ruling authority in the mid spring of 1895 altered not only the destiny of Taiwanese people but also the face of this island environment. At its most basic and radical level it was the conceptions of the new Japanese government about Formosa that initiated the environmental changes. In 1894 war broke out between China and Japan, and in 1895 China admitted defeat. After the Sino-Japanese War, Taiwan was ceded to Japan and became the first dependency of this newly developed empire after the 17th of April 1895.

From this perspective, we are in a position to consider an important question that through what networks the Japanese formatted the environmental knowledge for its effective governance. By archival work and sporadic expeditions, the Japanese began to explore the Formosa Island in the early period of colonial administration. Both of these two actions constituted the colonial knowledge-production networks. On the one hand, the intellectuals organised and compiled the accounts rendered by Western academic spheres and their outpost custom service. On the other hand, the individuals and groups of diverse professional disciplines were assigned to conduct fieldworks in Taiwan in the immediate appropriation. However, it is worthy of attention that either compiling work or expedition activities were principally undertaken by the persons affiliated with the Tokyo Imperial University in metropolitan Japan in these initial years. The domestically-based surveys made their appearance and stepped into the order, just merely after the organisation of bureaucratic system in island Taiwan.

Due to the lack of field experiences, the Japanese were forced to inherit knowledge relating to Taiwan from the western literature. The case of Takudzi Ogawa shows briefly how the Japanese scholars collected and analysed the notes and records regarding Formosa in a range of journals and magazines published by the Western institutions. In this process, the role Takudzi Ogawa played should not be underrated. Although Ogawa was not the first and the only one to organise the existing materials for knowing Taiwan, the multi-language proficiency, which are acquired through three stages of educational training, of Chinese, English and German enables Ogawa to write literal works from a variety of sources. The most important of all is that what Ogawa attempted to present was a comprehensive geography of Taiwan rather than a series of descriptions, narratives and records which were made by few Japanese between the 1870s and early 1890s. This kind of descriptive records were made by few Japanese individuals ever visited Taiwan, such as Majiro Kurita

(栗田萬次郎) presented the short notes on list of the plant species documented with the Japanese expedition against the *Bootan* tribe of aborigines in the southern Formosa in 1874 (Kurita, 1888a; 1888b; 1889a; 1889b), the official visit of Consul Seniji Ueno (上野專一) in 1881 and 1891 (Ueno, 1894), the preliminary survey of conditions by Sukenori Kabayama (樺山資紀) in 1873 and so on.

Whist Ogawa initiated an effort to insightful geographical understanding of island Taiwan, he benefited greatly from his multi language proficiency. The following memorandum, according to Takudzi Ogawa's autobiography,²³ does not pretend to give a complete picture of Ogawa, but does outline his experience of language training. As early as his childhood, Ogawa came into contact with the classical readings written in Chinese through his father, Nanmei Asai (淺井南溟). Asai was a student of Confucianism, who was not only familiar with the Chinese classics but also taught Chinese texts, and established his own private school²⁴ in Wakayama (和歌山) after the Meiji Restoration. In 1886, Ogawa went to Tokyo for high school education at his age of seventeenth. Before attending the Tokyo First High School (東京第一高等學校), he choose the Tokyo English School (東京英語學校) rather than the other two public schools as his preparatory education. The format of high school education at that time was constituted of two-year 'Main Subjects' (本科) and three-year 'Pre-Subjects' (豫科). Main Subjects are further divided into three divisions, the Art and Law (法文), the Science and Technology (工理) and the Medicines (醫), while Pre-Subjects are divided into three foreign language groups, English, French and German. Ogawa belonged to the Art and Law division with German profession. Although he deferred in his high school study, Ogawa pursued his ambition in the Department of Geology, the Tokyo Imperial University finally. To promote his learning in geology discipline, Ogawa in advance studied German in the School of Deutsch Society (獨逸協會學校) before attending university (Ogawa, 1941).

Takudzi Ogawa published a journal article and an all-inclusive book in relation to Taiwan successively. The former was a translation work, while the latter meant an ambitious contribution. In 1895, the very year of the Japanese annexation of Formosa, Takudzi Ogawa submitted one short essay on Formosa in the *Journal of Tokyo Geological Society* (地質學雜誌) with one senior geologist. He at that time was still an undergraduate

²³ This Ogawa's autobiography is originally published in the form of individual articles in separate volumes of *The Journal of Geographical Education* (地理教育). After the death of Takudzi Ogawa in 1941, his eldest son- Yoshiki Ogawa (小川芳樹) collected these articles and issued the book '*The Career of one Geographer: The Autobiography of Takudzi Ogawa* (一地理學者之生涯：小川琢治之遺著)'.
²⁴ That is 'Juku 塾' in Japanese, commonly translated as 'private academy'.

student of senior level in the Department of Geology, College of Science which is based in the Imperial University. *The Island Taiwan* (臺灣島), by Yamajiro Ishii (石井八萬次郎) and Takudzi Ogawa, one of the earliest Japanese translation accounts, was from an article in a German magazine (Ishii and Ogawa, 1895). The German author compiled this paper on the basis of two reports given by a British Acting Consul- Alexander Hosie (1893, *Report on the Island of Formosa with Special Reference to its Resources and Trade*) as well as a Consul de France, Camille Imbault- Huart (1893, *L'île Formose: Histoire et description*) respectively. Although both Ishii and Ogawa were geology-trained, most of the descriptions they selected in this document focused on folklore and human geography rather than physical environments. Definitely, this sort of extraction is highly confined to its original contents. The title of this German-written article is not clearly stated, however, according to Ogawa's later work, it may be one of Alfred Kirchhoff's contributions, according to Ogawa's later statement, '*Die Insel Formosa*' (The Island Taiwan), '*Bewohner der Insel Formosa*' (Inhabitants of Island Taiwan), or '*Die Wirthschaftsverhältnisse der Insel Formosa*' (Economy of Island Taiwan) (Ogawa, 1896).

In 1896, one gazetteer '*The Taiwan Isles*' stating the physical conditions and human geography of Formosa was published under command of the Tokyo Geographical Society (東京地學協會). This volume concluding the Japanese geographical knowledge about Taiwan before her actual annexation of this island was compiled by the young geologist and geographer, Ogawa. Originally this book should be completed by Kotora Jimbo (神保小虎) who was a teaching staff and expected merely to appear as a short translating compilation from several papers which were contributed by Kirchhoff in the German scientific transactions '*Petermanns Mitteilungen*'²⁵. In compiling the work, Ogawa made good use of the holdings in the libraries not only affiliated with the Tokyo Geographical Society, but also established in Deutsch Asiatic Society, Tokyo Imperial University and Tokyo Ueno (上野) Library.

The Taiwan Isles of Takudzi Ogawa deserves proper and fair assessments. It partly satisfied the aspirations of Japanese scientists, engineers, and officials on Taiwan in the earlier years of administration. It was obvious that the book was an introduction to Formosa's physical and human geography. For example, the enthusiastic administrators got easily a quick image about the distribution of particular industrial activities, such as that sugarcane was extensively cultivated in southern plains, tea was normally planted in west-northern hill slopes, and camphor was typically collected in inland bordering the tea farms.

²⁵ The scientific journal, in German language, was first published in 1855.

Therefore, the contents of this book (Table 3-2) which concluded the Japanese intellectual knowledge pertaining to Formosa at that time are of interest of enthusiasts as well as the frequent advertisements before and in publication, so it was said that a minimum of one thousand and five hundred copies of the book were sold out.

Table 3-2 Contents of ‘The Taiwan Isles’

Chapters	Japanese Title
History of Explorations and related records	探検の沿革并に文書
Outline	總説
Ocean	海洋
Mountains and Rivers	山嶽及び河流
Geology	地質
Climate and Meteorology	氣候及び氣象
Biology	生物
Peoples	住民
Industry	産業
Transportation	交通
Physical divisions and chief towns	天然の區劃及び都邑
Brief history	沿革

In addition, the way in which multi-language literature is cited in this book should also be paid attention. Take the chapter one ‘History of Explorations’ for example, the Western language articles and books which include English, German and French ones could be seen in it. This original bibliography enlisted in ‘The Taiwan Isles’ was organised chronically by Ogawa. Of these twenty four cited works, up to eighty percentages of accounts were written in English. Apart from five citations, almost all of them came from publications of the societies for geography and regional interest. Therefore, it suggests that Japanese intellectuals, represented by Ogawa, not only preferred to trust the Western documents, but also pursued for the newer information released by dominant institute. Least in the case of Taiwan geographical knowledge, these Japanese intellectuals who were educated during the Meiji Emergence attempted to be acquainted with the island, through a range of languages literature, such as Japanese, Chinese, English, German and French.

In a wider sense, the Japanese inherited knowledge of Taiwan environment from European publications could also be exemplified by the zoological case. The Japanese zoologists expressed considerable interests in the feature and position of natural spheres in Formosa. Although only the brief descriptions of *mammalia*, *aves*, *mollusca* and

rhopalocera were selected to be listed, it was clear that the zoological specialists represented by Motoyoshi Namie (波江元吉) had attempts to depict the fauna of Taiwan. Namie, an assistant Professor affiliated in Tokyo Imperial University, although he had never arrived in this island, he contributed a piece of review article titled as ‘*Collective report of animals in the new territory of Empire, Taiwan*’ (帝國新領地台灣動物彙報) in the *Zoological Magazine* (動物學雜誌) based in Japan (Namie, 1895: 265-298). Most of these species were discovered by Robert Swinhoe and derived from Swinhoe’s works in *Proceedings of Zoological Society of London* (Swinhoe, 1865: 196; 1866: 146; 1870: 615-653). Furthermore, Namie singled out the species found in Japan as well as enlisted in Alfred Russell Wallace’s masterpiece ‘*Island Life*’ published in 1858.

The early Japanese intellectuals in the colonial period aimed to format a rather comprehensive knowledge about the Taiwan geography through digesting and absorbing the existing work of Europeans. After examining some materials above, it is clear that the source of earliest Japanese knowledge production was inspired by multi-language publications. Certainly, the Japanese intellectuals in the earlier years of occupation seemed to legitimate if not accumulate knowledge about Taiwan chiefly by referencing a variety of European academic contributions, such as the Anglophone, Francophone and Germanophone masterpieces. The multi-language proficiency of the Japanese intellectuals of this generation reflects their shared educational training experience.

In addition, it is suggested that the reason why the Japanese compilers preferred the Western references to the Chinese source materials is that the former provides more crucial and suitable information for the governing purposes. For example, the distribution and composition of stratum reflect the existence of mines and ores as well as the genre de vies of local residents reveals the types and potentials of agricultural production.

SPORADIC TRAVERSE EXPEDITIONS BY THE JAPANESE

Not satisfied with the second-handed knowledge on Taiwan mapped by Western explorers and travellers, the Japanese central government assigned her own pioneer academicians to undertake fieldtrips for further precise information nearly simultaneously. For that reason, this section will start with outlining the Japanese expeditions progress, then specifying the early exploratory activities into the highland Taiwan.

The terms of ‘savage’ and ‘savage districts’ (‘savage territories’) obviously disparage the races, but vividly reflect how the outsiders imagine the domestic aboriginals. On the

one hand, in Formosa of the Qing regime, the ‘savage districts’ meant the new lands which were unexplored, uncultivated and ungoverned. Although the *Han* Chinese were not allowed to step into the above domain legally, they invaded the terra of aborigines actually. The ‘savage districts’ in Formosa became a constantly-shrinking area all around the Qing years.²⁶ On the other hand, the Japanese definition of this term shaped itself along the different stages of rule. It is not difficult to point out the ambiguity of the notion ‘savage districts’ or the later term ‘Savage Territory’ by examining the official Japanese documents produced in the earlier years of authority. Most of the colonial officers asserted that the land had been occupied by the aborigines, but not necessarily owned by them. More discussions relating to the legal status of aborigines versus land possession will be made in Chapter 4. The Japanese preoccupied consciousness that ‘savage districts’ is ‘the land of savages’ had led to the never-stopped intertwine of ‘savage districts’ surveys with ‘savages’. Within the existed and definite framework, the scholars and officers not only made endeavour to improve the knowledge on ‘savage districts’, but also chose to reframe the elements, and put them in a new planned order.

Military Explorations

The first pages of exploratory history in the ‘savage districts’, without question, were compiled by military staff. Due to the insecure state in the ‘savage districts’, only the military expeditions and explorations might be made in the earlier years of Japanese administration. Supported by powerful and overwhelming weapon advantages, some soldier-constituted exploratory teams stepped into the ‘savage districts’. In the first season of 1897, for example, some five teams were assigned the duty of trans-island railroad surveys (Formosa Government Army Staff, 1906: 444, 446, 451, 459-460, 467-469, 477-478). The colonial authority expected, according to the scheme for trans-Formosa railroad route survey, not only the facts that would help the construction of transportation across the island but also the information, such as reliefs, forests, tribes, and industries, along the exploratory routes (Formosa Government Army Staff, 1906: 432-433). Unfortunately, not many existing documents relating to these opening journeys are available. However, some of their journals, intentionally or unconsciously, provided

²⁶ Relating to the transfer or deprivation of the aborigines lands to *Han* Chinese in the Qing dynasty, see the discussions made by Tien-Fu Shih (施添福) (1990) *The Earth-Ox Borderline and Regional Development in Chu-Chhien of Qing Taiwan: A Study of Historical Geography* (清代臺灣竹塹地區的土牛溝和區域發展——一個歷史地理學的研究), *Tai-Wan feng wu* (臺灣風物) 40(4): 1-68; Chih-Ming Ka (柯志明) (2001) *The Aborigine Landlord: Ethnic Politics and Aborigine Land Rights in Qing Taiwan* (番頭家：清代臺灣族群政治與熟番地權). Taipei: Institute of Sociology, Academia Sinica.

valuable information for successors in a range of disciplines, on the unexplored part of this island.²⁷ The pioneer experience of Yoshitora Nagano (長野義虎), known as the first Japanese who undertook voyages to the ‘savage districts’ of Taiwan, is worthy of occupying the bulk of text in this statement. From these few records based on Nagano’s action, we can still peek at what was going on in this prologue of Japanese expeditions therefore. These memorable expeditions made by Lieutenant Nagano of the army forces marked the Japanese presence in highland Taiwan.

Two of Nagano’s journeys are documented and disseminate more extensively, although he conducted several ‘savage districts’ expeditions which included the *Alisan* (阿里山) area of 1896, the *Alisan* and *Bunun* tribes in the spring of 1897, the *Takoham* (大崙崁) and *Nansho* (南庄) area in July of 1897, the *Suo* (蘇澳) and *Karenko* (花蓮港) area in August of 1897 and the *Bokusekikaku* (璞石閣)- *Patunkuan* (八通關)- *Rinkiho* (林杞埔) journey in the autumn of 1897. The first famous journey which refers to the *Alisan* expedition in 1896 provides much more ethnographical records to the public, as Nagano reported mainly the life of visited tribes, such as the food, clothing etc. What were observed in this journey were not only oral-addressed in one Tokyo-based seminar held by the Tokyo Geographical Society in May 26th of 1896, but also published in its associated journal (Nagano, 1896: 351-158). This experience inspired some of participants at one monthly meeting, represented as Ryozo Torii (鳥居龍藏) who became one of the pioneer anthropologists who visited Taiwan and studied the primary peoples of the island in later years. By contrast, the second valued expedition which was undergone in the latter half of September 1897 revealed more environmental information apart from the human geography. Also, the discoveries of this second expedition were talked about on another occasion in *Taihoku* (臺北), Taiwan, in a public lecture which was held by the Board of Communication, the Civil Bureau of the Formosan Government.

Non-systematic observations but faithful documentations undoubtedly provided a series of sporadic but valuable landscape information. The real purpose of Nagano’s savage district expedition failed to be understood, according to existing materials. However, the initial and faithful documentation indeed had become the chief reference for succeeding enthusiasts. As stated as above, Yoshitora Nagano continued his exploratory activity inland after the due completed journeys in the other portions of eastern Taiwan. Accompanied by

²⁷ See, for example, Toshitora Sone’s records. Toshitora Sone (曾根俊虎), (1899) A Journal of Savage Territory Exploration in Taiwan (臺灣蕃地探檢紀行), *The Transactions of Colonisation Society* (殖民協會報告) 11: 2-12.

local aboriginal guides and guards, Nagano departed from one of the gate villages to the 'savage districts', *Bokusekikaku*, in the 16th of September. On the way westward, he tirelessly noted the natural landscape alongside. For example, people could see the oak trees of *Quercus cuspidata* (椎, しい, shii) (欒, かし, kashi) and the rock formation of slate (粘板岩) when approaching at *Tatsuke* (卓溪), followed by the cinnamon tree (肉桂樹) in the *Iroko* (異祿閣) tribe, then Taiwan Loquat (山枇杷, *Eriobotrya deflexa*) and cinnamon trees in *Magatsu* (蚊仔厝) tribe and so on (Nagano, 1936). In addition, he also collected rock specimens which became important evidences for the geological formation of this area, at the crest of Mt. Jade, the highest peak in this traverse journey. Nagano arrived at *Rinkiho* finally, after about seventeen days. Although it is uncertain that Nagano was really able to tell apart the rock and tree species, the detailed records made sense truly. Nonetheless, the following enquiry is how these non-systematic but quite faithful records of exposed rocks and forest landscape had been identified and assessed by subsequent professionals and officers.

Professional Investigations

Not only the military explorations, but also the metropolitan-based professional investigations boomed immediately after the Japanese presence in Formosa. Numerous experts, who were faculty, staff or students, were assigned to investigate this newly annexed territory. Their experience levels varied individually. Some of them were skilled scholars, who were responsible for government matters in Japan, and some even participated in the military service when the Sino-Japan war was in fire, still some were the young postgraduates who had struggled for their early academic career. However, most of these exploratory individuals or teams were associated with the Tokyo Imperial University (東京帝國大學, hereafter TIU). Since Formosa became a dependency of the newly-emerged empire, the College of Science (理科學) and the College of Agriculture (農科學) which were affiliated with TIU were required to give members for exploratory purposes. These works were sponsored by the Japanese Imperial Diet (帝國議會), which was the highest council of this nation. The involved disciplines which participated in this enterprise, mainly natural science based, include anthropology, botany, geology, forestry and zoology (Wu, 1997: 26-28).

At this point, however, the most attention-getting questions that needed to be answered is how the authority could determine the strategy, items and personnel they were going to commence the environmental surveys. These environmental surveys are highly concerned

with the resources' distribution, quantity and quality. Although these investigations were implemented in different methods in terms of their disciplinary training, they shared some similarities in data collection, interpretation and exchange. The forthcoming analysis is not intended to reconstruct the knowledge formation of each figure or each subject, rather to portray a broader picture about the 'savage districts' knowledge as a whole. What follows is an example in relation to Taiwan forests, as it is not easy to have other survey cases.

Seiroku Honda, who was accompanied by Okusaku Saito (齋藤音作, the Director of Rinkiho Savage Territory Office 林杞埔撫墾署), Sentaro Tsukioka (月岡貞太郎, a staff of Forest Affairs Section 林務課, Board of Production 殖産部), and the other members of this expedition team, started his short stay in May 1896. Like the route Nagano passed about one season ago in the same year, Honda and his fellows traced the River *Takusui* (濁水溪) easterly, then moved SSE into its tributary, the River *Chen-Yolan* (陳有蘭溪). They forwarded upstream, through *Namaka* (南仔腳), *Tonbu* (東埔), and ascended Mt. Jade (玉山) finally. Regardless of the main purpose of Honda, his field trip brought in quite many, not systematic but interesting, findings to the metropolitan Japanese academics, such as the hydrology, geology and vegetation.

Although there had been many different peoples who had lived in the island for more than hundreds of years, they in fact possessed no precise or modern-sense knowledge about the Mt. Jade (known as Mt. Morrison in Western literature and renamed as Mt. *Niitaka* (新高山) by Japanese emperor in 1897). For example, the first height measurement of the Mt. Jade was completed by the Honda's team through a scientific instrument, the barometer. The peak of Mt. Jade was 4145 meters in height and ranked as the highest mountain in the whole territory of the Japanese empire. That is the reason why the Japanese named the mountain as Mt. *Niitaka* which means the 'new high mountain'.

In terms of the geological formation, on the other hand, Ogawa Takudzi first roughly postulated that Mt. *Niitaka* is constituted of Arkoses by the microscope observation of only two rock specimen gathered by fellow of Mr. Honda's team in the February issue of the *Journal of Geography* in 1897 (Ogawa, 1897: 87-88). Arkose refers to one type of sandstone derived from the disintegration of granite or gneiss, and characterised by feldspar fragments. In April of the same year, nearly simultaneously, the much more detailed examination work was completed by Tetsugoro Wakimizu (脇水 鐵五郎) who was a Bachelor of Science graduated from Department of Geology (地質學科), College of Science, Tokyo Imperial University, as well as expertise in mineralogy and lithology.

Offered by the collection of Seiroku Honda's trip, Wakimizu made the analysis of fourteen samples which were collected in more than three sites, such as *Namaka*, *Tonbu* tribe (東埔社) and *Pattonkan* (八通關), near the Mt. *Niitaka*'s vicinity. By this, he not only identified the categories of the rocks collected, but also outlined the geologies featured by Honda's trip route, i.e. the geomorphologic conditions along the River *Chen-Yolan* (Wakimizu, 1897: 274-276). In addition, it is Wakimizu that invited Honda to submit a series of amended articles, titled as *The Botanical Geography in Japan* (日本植物地理に就て) (Honda, 1902: 157-158; 160-161) which is based on his previous publications, in the 1902 volume of *The Journal of Geography*.

Seiroku Honda, one of pioneer foresters who experienced real fieldwork in Taiwan attempted to integrate (or absorb) the forest belts of Taiwan into original Japanese category system. Before Honda's work, two individuals had built up two kinds of classifications separately, prior to the Japanese occupation of Taiwan. In this light, it is surely impossible that the two classifications above extend to the newly annexed area-Taiwan. Through conducting the short-term but valid fieldtrips personally as well as referencing some documents compiled by previous officers and professionals, Honda amended and formatted the new category system in the late 1890s. Honda divided the forests in the Japanese Empire as four belts (Plate 3-2), including the 'Tropical forest or Ficus²⁸ belt'(熱帶林又ハ榕樹帯), 'Warm-temperate forest or Quercus²⁹ belt'(暖帶林又ハ櫟帯), 'Cool-temperate forest or Fagus³⁰ belt' (溫帶林又ハ榲帶), 'Boreal forest or Abies³¹ belt' (寒帶林又ハ白檜、榧松帯) This thesis, *Japanese Forest Belts* (1900, 日本森林帯), was later developed as the principal achievement of his Ph. D., which is titled as 'Forest Zones' (*Waldzone* or *Waldregion* in German, 森林植物帯論 in Japanese).

The example of Honda also provides an insight into the links between silviculture and other scientific expertise, as well as metropolitan sphere and its colonial civil services. Honda's work benefited a lot from the provided information about vegetation in some reports made by civilians, such as Sentaro Tsukioka and Mataji Nishida (西田又二) (Honda, 1900: 21; 31-32). The results and effects of these civilian engineers and technicians need to be further reviewed.

²⁸ Banyans

²⁹ Oaks which include live oak or evergreen oak, etc.

³⁰ Beech family, ex. Japanese beech

³¹ Firs, represented by '*Abies sachalinensis* (榧松 or とどまつ)' and '*Abies mariesii* (白檜 or シラビ)'.

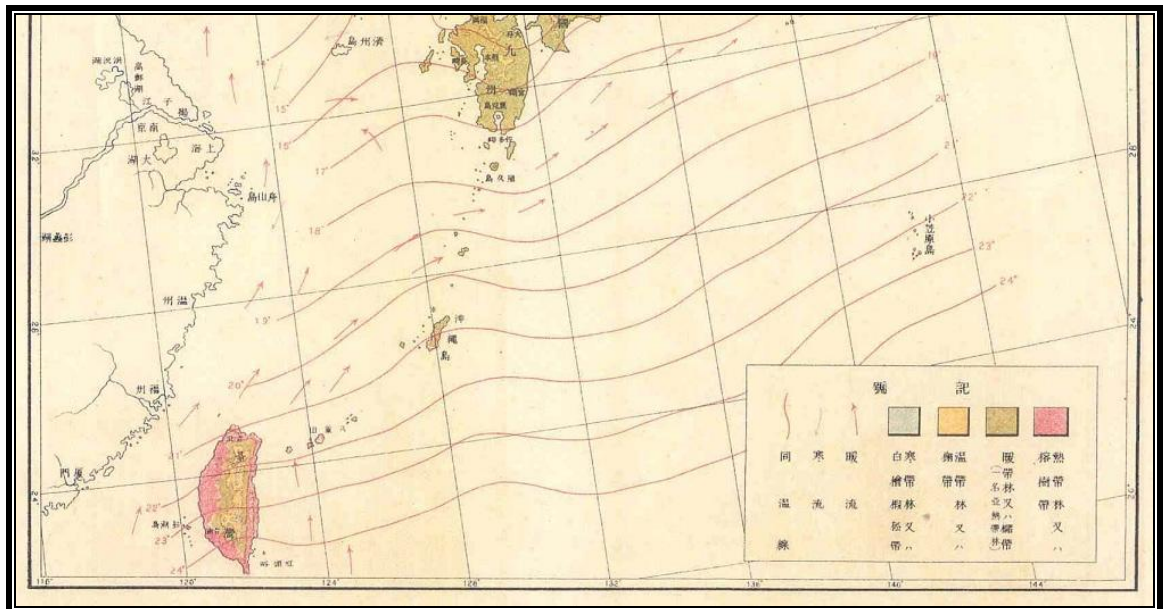


Plate 3-2 Honda's Japanese Forest Belts, with special reference to Taiwan island

Source: Honda, Seiroku 1900, *The Forest Zones in Japan* (日本森林植物帶論), Tokyo.

Note: Tropical forest in red colour, Warm-temperate forest in green, Cool-temperate forest in yellow, and Boreal forest in blue.

CIVILIAN SURVEYS BY THE BOARD OF PRODUCTION

The third type of fieldworks were activated by the Board of Production (殖産部), which was the first office entrusted with the oversight of land management and industry development affairs since the end of 1895. However, the promoted environmental surveys in highland Taiwan varied as the differential status of agriculture, forestry, mining industry and so on, had occupied in the government. For example, the geological surveys almost ceased in 1898, due to the reduction of the Mining Section to one division (係) under other section (Editor, 1943: 1-2). This is the reason why the geology-trained officers were absent in the environmental surveys of the 'savage districts' from the end of nineteenth century to the mid 1920s. The discussions will be focused on geological and silvicultural explorations, as both of these disciplines paid much more attention to the lands than anthropological, botanical and zoological sciences. The latter three might be of interest to the customs of aborigines, the morphology of plants and the distribution of animals.

The First Survey Authority: the Board of Production

According to the original will of the colonial authority in Taiwan, the Bureau of Production (殖産局) was planned as one of the first rank departments which administered

directly under the Formosan Government.³² The other same rank organs are the Bureau of Army (陸軍局), the Bureau of Navy (海軍局), the Bureau of Internal Affairs (內務局), the Bureau of Finance (財務局), the Bureau of Communication (遞信局), the Bureau of Justice (司法局) and so on. In this draft which was made in the summer of 1895, two sections of the Agriculture Affairs Section (農務課) and the Trade and Manufacture Section (商工課) were proposed to foster a range of existing and new industries on the island. The former was the authority in agriculture, sericulture, tea-making, sugar refinery, camphor, fishery and forestry, while the latter was responsible for trade, manufacture, and mining matters.

However, the actual approved unit at the end of 1895 was the Board of Production and ruled by the Civil Office (民政局). It started as a not very great department, which has the Agriculture Affairs Section and the Trade and Manufacture Section. In addition, one extra agency for inspecting gold-dust work was hosted in it.³³ A further change in the organisation of the board resulted in the sub-division of old departments and the making of new sections. The four sections of the Agriculture and Commerce Section (農商課), the Colonisation Section (拓殖課), the Forest Affairs Section (林務課) and the Mining Affairs Section (鑛務課) constituted the fresh Board of Production.³⁴

Three key points are worthy of attention. First, the new Colonisation Section took over the responsibility for settlement, reclamation, waste fields and the 'savage districts'. Secondly, the Forest Affairs Section which was isolated from the previous Agriculture Affairs Section, had begun to be responsible for the management of camphor and forestry. Finally, the Mining Affairs Section was divided from the Trade and Manufacture Section and involved only with the affairs of mining and geological survey.

The frequent adjustment of the organs in the colonial government implied not only the trials of authorities in ruling policy but also their enhancement of knowledge about this annexed land and its people. The Formosan Government recognised the real existence of 'savage districts'. Besides, it seems that the forestry and mining had caught officers' eyes increasingly, as these affairs were also identified and assigned to specific new sections. Until now, however, the colonial authority had not correlated the 'savage districts' with the forestry and mining tightly. Further determination of 'savage districts' or highland

³² Draft for Formosan Government Organic Law (臺灣總督府諸官制草案), Formosa Government Archive (臺灣總督府公文類纂, hereafter *FGA*), 1895, V2/A30.

³³ Schedule for Personnel in Offices (各部課配員表參考トシテ合綴), *FGA*, 1895, V2/A33.

³⁴ Comments on the Organisation of the Board of Production (殖産部長分課規定意見), *FGA*, 1895, V2/A31.

development policy would not be complete without further environmental surveys.

Several discussions about Formosan highland policy took place in government departments, such as whether mining or forestry should be given priority in real highland administration and developmental modes? But this kind of debates could not be solved only by the temporary study tours which were undertaken by the metropolitan professionals. In contrast to those metropolitan experts who had only short stays in Taiwan, the civilian engineers and technicians who took charge of governmental or local office affairs were capable of surveying the environment of this island more easily. Though, unbalanced environmental surveys of forestry and mining industry resulted from the oblique scale of their response organs in the government. The development of environmental surveys, in the context of mining and forestry authority, would be detailed as follows.

Mining and Geological Surveys

The formation of geological knowledge is a complicated issue, as its diversity in sources of origin. The producers of this kind of knowledge may collect materials from different individuals, institutions and disciplines. Also they undertook personal field works or study tours to compensate the shortage of their knowledge somewhere. To demonstrate this, the production of geological knowledge in the 'savage districts' would be exemplified as the compilation work of '*An Explanatory Book for the Geological & Mineral Map of the island of Formosa*' (臺灣島地質鑛產圖說明書) by Yamanjiro Ishii (Ishii, 1897). This first set of book and map which sees the whole island as a whole, was attempting to outline the contour of Formosan geology. The way by which these pioneering geologists and mineralogists framed the 'savage districts' geological knowledge from a variety of source materials could be partly learned by this book, although it is not prepared for this area specifically.

It is surprising that the colonial authority in Taiwan, represented by Ishii Yamanjiro, produce the sort of geological description and relevant cartography at the end of 1897, after merely two years of occupation. In terms of the geological surveys in Taiwan, the role of Yamanjiro Ishii should not be underrated. Sojiro Yokoyama (橫山壯次郎) initially made a promotion of geological surveys in Formosa eagerly when he stepped on this island (Editor, 1895: 333-334), but Ishii established the main tones of the geological surveys practiced in Taiwan. Yokoyama became the first Director of the Board of Production in May of 1895, and then Ishii succeeded in December of the same year. In April of the next year (1896), the Mineralogy Section was created and initiated the nearly two-year

(1896-1897) geological surveys, which were under Ishii's leadership, all around the island (Inoue, 1902: 448-453). The conduct was originally planned to fill all blanks of geological sheet around this island, but actually most of the 'savage districts' were excluded.

During this short but not ignorable period, there were several limited achievements. Take Yamanjiro Ishii for example, most of his footprints occupied the outside areas of it, in addition to the three trips into the 'savage districts' (Inoue, 1902). According to the original scheme constituted by Yokoyama and Ishii, the proposed plan the 'Taiwan Geological Survey' which styled the surveys have been made in Japan under command of the responsible institution, the 'Geological Survey', Ministry of Agriculture and Commerce, Japan (農商務省地質調査所) would be divided into two stages. It includes the three-year Preliminary Survey (豫察調査) and the five-year Detailed Survey (精察調査). Simultaneously, Special Surveys (特別調査) on mines, such as coal mine, gold mine and so on were promoted. However, the actual practices were that the civilian geologists merely completed the preliminary surveys in limited time and were forced to undertake special surveys in the following decades due to the lack of investment. Therefore, the geological surveys of this period might be also deemed as 'Mineral surveys'. No matter what disciplines the professionals belong to, they were accustomed to outline or demonstrate the observed by presenting the cartographies of objects. The environmental images of the new dependency impressed the Japanese academic sphere swiftly in the early years of administration.

Forestry and Forest Surveys

Compared to the interruption of the geological survey enterprises, the forest surveys proceeded continually. Also promoted by the Board of Production, the forest surveys sprawled more broadly (Table 3-3). Even though the comparatively low-lying, accessible plain country and mountain district were covered mainly in the forest surveys which were organised by the Board of Production, the achievements of this institution on forest knowledge should not be ignored. The six civilian engineers or their groups, who were affiliated with the Board of Production, took charge of the forest fieldworks in different administrative districts respectively. They are Doyu Hachito (八戸道雄), Sadataro Tsukioka, Masamori Arita (有田正盛), Mataji Nishida, Seishio Konishi (小西成章) and Ikeyoke Shiwa (志和池榮介).

Table 3-3 Forest Surveys immediately after the Japanese annexation of Taiwan

Surveyor	Area	Year
Doyu Hachito (八戸道雄)	Shinchiku (新竹), Byoritsu (苗栗)	1896 Jan
	Horisha (埔里社)	1896 Feb.
	Rinkiho (林杞埔)	1896 Jul.
	Banshoryo (蕃薯寮)	1897 Mar.
	Barisa (叭哩沙)	1897
	Taito(臺東)	1900
Sadataro Tsukioka (月岡貞太郎)	Giran (宜蘭), Kirai (奇萊)	1896
	Shinchiku (新竹)	1896
Masamori Arita (有田正盛)	Taihoku (臺北), Taichu(臺中)	1896
	Daikokan (大嵙崁)	1897
	Boko (澎湖), Tainan (臺南), Honzan(鳳山)	1897
Mataji Nishida(西田又二)	Nansho (南庄) *	1896 Dec.
	Taiko (大湖) *	1897 Jun.
Seishio Konishi (小西成章)	Goshisan (五指山) *	1897 Aug.
Ikeyoke Shiwa (志和池榮介)	Tosekikaku (東勢角) *	1898

Note: * means the works undergone in the 'savage districts'

Source: Report of the Board of Production, Civil Service, Formosa Government (臺灣總督府民政局 殖產部報文)(1896) Vol.1, No.2; Report of the Board of Production (1898); Report of the Board of Production (1899).

In one word, the forest knowledge in connection with the higher elevation in interior Taiwan was quite deficient. For instance, the Government represented by the civilian foresters had little idea about the spatial distribution of precious soft woods, such as Hinoki (扁柏 *Chamaecyparis obtusa var. formosana* (Hay.) Rehder) and Benihi (紅檜 *Chamaecyparis formosensis* Matsum), although these temperate tree species of this island would become the chief forestry products exported to its parent state, Japan, for consumption. The discovery of high-valued *Chamaecyparis* which means a genus of conifers in the cypress family would not be commenced until the more active movements of the Government to the 'savage districts'. In addition, the indication of non-forest land, such as cultivated land and residence implied that the Government had to face this sort of land items and started to consider the way to dispose them.

These records which were originally presented as reports to the Board of Production not only were collected and published to the populace in the name of *Report of the Board of Production* (殖產部報文), but also were rearranged to further analysis. An examination of

the Planned Government Forests after the Forest Survey (森林調查濟豫定官林概要) was made in April of 1898, on the basis of the results acquired from Mataji Nishida on *Nansho* and *Taiko* (大湖), Seishio Konishi on *Goshisan* (五指山), and Ikeyoke Shiwa on *Tosekikaku* (東勢角). Firstly, there are five main land types in this category, including the Coniferous forest (針葉樹林), the Camphor-based mixed forest (樟雜林), the Oak-based mixed forest (櫟雜林), the Mixed forest (雜木林) and others. Namely others are Bamboos (竹林地), Cleared woodland (伐跡地), Wild land (原野地), Cultivated land (耕地) and Residence (宅地). Secondly, the emphasised forest composition of camphor and Oak in a variety of tree species implies the economic importance of these geneses in Formosa Government strategy. Last but not least, the document compiler clearly declared that the forthcoming forestry management would be highly based on these findings of the forest acreage and forest state (FGA, V9807/A18). Contributors approached the environmental knowledge from diverse disciplines

CONCLUSION

Since the Japanese administration, the 'savage districts' had become a new arena for exploratory activities. A variety of explorations and surveys followed the Japanese annexation of Taiwan immediately. Apart from the activities that occurred in the plain countries; several fieldworks took place in the 'savage districts' before the more aggressive pacification movements which have triggered since the first decade of the twentieth century. These numerous journeys could be typified into the military explorations, the professional investigations and the civilian surveys. This sort of classification does not mean that those groups of different forms had little or no links between them. By contrast, most of the exploratory results of the pioneers would transmit to other clusters through some kind of circulation systems, although sometimes seems unilaterally. That is to say that each endeavours of these pioneer individuals dedicated to the shared knowledge of Formosan highlands or the 'savage districts'. None of them should be omitted, if you expect the environmental picture to be complete. The exploratory activities together helped to make the colonial environmental images clearer, although the process of different aspects was rather diverse.

The Japanese knowledge about the Taiwan environment was the product of numerous networks. The environmental knowledge intertwined the Western natural-scientific concerns and their own colonial-scientific surveys. Although the former comprised of, more or less, some imperial interests, it eventually failed to satisfy the requirements for

colonial rule and administration. Geographical records which were compiled by missionaries, scientists, and custom officers not accidentally admired the natural wealth of the Island of Formosa. However, confining to the Chinese government's access-forbidden policy implemented in the 'savage districts', the Western-produced knowledge drew attention to the plains and lower hills exactly, especially the west part of Taiwan. Within this spatial framework, the Japanese turned their concerns forward to the east half of the island and its centre. A number of trans-Formosa journeys undertaken by metropolitan specialists and local officers not only added the geographical understanding in quantities, but also altered the environmental knowledge in qualities (Figure 3-5). The colonial authority's quest for knowledge displayed its interests and purposes. It concerned especially about the possibility of becoming of resources.

Becoming of resources resulted from the conceptualisation and classification of natural environment. A new form, three-dimensional conceptions relating to highland Taiwan thus emerged and introduced the variations in many physical and human aspects to the world, especially to the Japanese authority. Fragmented materials and information collected in a range of exploratory expeditions became unquestionably some of the references for subsequent officers and experts. From different aspects, these pioneers displayed the appearance of the island's people and land to the imperial government and populace. Among them, Seiroku Honda, one of the forestry scientists, applied the concept of 'Forest Belts' to describe the natural forests in Taiwan and indicated the potential and promising belts in terms of forest wealth. A small number of sorties which traversed the Central Ranges were carried out by the Tokyo Imperial University specialists who were trained in anthropology, botany, geology, silviculture, and zoology.

Through scientific and official networks constituted by the Japanese, some geographical facts relating to the 'savage districts' were, for the first time, 'discovered', recorded, and circulated. Although scanty and partial, the data collected from the fields were carefully and intentionally transformed into scientific information potentially. By literal description, instrumental measurement, specimen identification and so on, the metropolitan scientists acquainted themselves more with the Formosa environment. However, the images which these scientists shaped were formal-scientific oriented rather than colonial-scientific. In other words, it was not necessary that the information would satisfy the requirements of colonial governance, although the scientific experts possibly made some suggestions for practice. For example, Honda advised that the lower part of coniferous forests where cypress occurred broadly in Taiwan may be potential areas suitable for forestry exploitation (Honda, 1900: 26-27).



Figure 3-5 Comparison of Western explorations and geological and forest surveys by the Japanese

Source: Yeh, 2009:55; table 2; Inoue, 1902: 534.

The colonial authorities in Taiwan were therefore forced to establish their own departments and offices and to conduct their own survey activities such as geological and forest explorations directed by the Board of Production. Of course, this does not mean that the metropolitan findings did not matter to the local governmental surveys. As a fact, the final colonial-scientific design was usually a combination of theoretical framework set by the former and empirical modifications by the latter. Seiroku Honda's *Forest Belts* model is one of this kind of example. Honda's model was applied to the work of Sozo Nakai (中井宗三) '*Flora of Taiwan, with Special Reference to Timber*' (臺灣林木誌) (1914) and '*Illustration for Taiwan Forests Map*' (臺灣森林圖說明書) (1915). Nakai was a forest officer whose amendment for forest belts became the basis knowing forests in Taiwan, then establishing future forestry during colonial period.

Chapter 4 Environmental Demarcation in Japanese Taiwan

INTRODUCTION

The chapter aims to investigate the way by which the colonial Formosa Government imagined and demarcated the ‘Savage Territory’ as an innovative geographical region. Compared to the notion of ‘savage districts’, the ‘Savage Territory’ referred to a spatial unit with distinct limits. In later decades of Japanese rule, the region was gradually governed under authority, divided into sub-regions and administered by offices. Through sporadic field explorations by the late nineteenth century, the colonial authority had shaped gradually a vague impression about the highland Taiwan. The area was described as the ‘Savage Territory’ with natural wealth, such as forest and mineral resources. Almost simultaneously, the scholars, officers, and engineers had become involved in the territorialisation process of Formosa highlands.

To demonstrate this, this chapter explores successively the foundation of legal status as well as the establishment of governing departments, the enclosure of ruling space, the framing of developing strategy, and the construction of the forestry environment. An examination of this series of processes shows that the ‘Savage Territory’, by lawful means, was shaped as state-owned land and then was governed by various government departments. The spatial governance was enabled by combining the control of aboriginal people with the surveying of their occupied lands. The Japanese administrative interests and preference in terms of industrial strategy relating to mountainous regions laid chiefly on forestry development. Separate but interlocked discourses, such as the ‘savage squatting’, the conservancy of forest and river, and the economic lumbering, were integrated and galvanised the formation of the forest knowledge and subsequent forest division. The Reserved-Forest System reflected the will of the Government seeing and governing highland Taiwan.

FOUNDATION OF LEGAL STATUS

To rationalise the subjugation of the aboriginal population and to satisfy the demand to develop the ‘Savage Territory’, the colonial Formosan government had been gradually developing the discourse that the ‘Savage Territory’ should be the property of state or that *de facto* it already was owned by the state. The first decade of the Japanese rule over Taiwan witnessed numerous revolts, but the authority began to pay attention to the highlands part of the island later. Due to hard access to highland, the colonial Japanese state turned to sort out the way by which they would be able to possess this part of Taiwan.

The mentioned discourse could be traced to the Decree³⁵ No.7 of 22nd February 1900, enacted by the Formosan Government (臺灣總督府, *Taiwan Sotokufu*). Absolutely, several significant debates and discussions occurred on different occasions and gained momentum through almost the whole period from the late 1890s to the mid-1900s. This emerging doctrine is best exemplified by the Rokusaburou Mochiji's (持地 六三郎) legal views as we shall see below. By the time Samata Sakuma (佐久間 左馬太) assumed the post of Governor-General³⁶ (總督 *Sotoku*), the notion of the 'Savage Territory'= 'state-owned land' had already gained considerable traction .

The assertion that the state had the absolute right to possess and dispose of 'savage territory' had become an important issue, in the colonial government's policy for aboriginal-occupied areas. According to the Explanatory Statements (理由書) accompanying Decree No.7 of 22nd February 1900, ruled that aboriginals had no conception of ownership therefore could not own the lands (The Draft of Taiwan Historic Materials³⁷, 1900: 44-45). The Governor-General Gentaro Kodama (兒玉 源太郎) decreed that:

The non-savage is not allowed to occupy and utilise the savage territory by whatever reasons. However, the rule would not apply to the conditions that if extra provisions existed or the permission of Taiwan Governor-General is awarded. If any disobedience, someone will be fined or imprisoned for penalty (DTHM, 1900: 43-44).

In addition, the statement implied that 'non-savage' individuals, groups, or enterprises may have opportunities to occupy and use the lands there, if they are charted particular rights. Some of these cases relating to the non-aboriginal involvement in highland development will be further discussed later in this article.

This effectively alienated all aboriginal groups from *de jure* ownership of their land returning to them usufructory rights on the sufferance of the government. The proclamation for the 'Savage Territory' = 'state-owned land' was further strengthened through Mochiji's discourse and put into force in the subsequent decades too. Mochiji, who was born in Fukushima (福島) in north-eastern Japan and graduated as Bachelor of Law, came into the service of the Formosan Government in 1900 and then was appointed as a Counsellor (參事官) in 1901. The legitimacy of pacifying aboriginal peoples, for the Formosan

³⁵ Decree, *Ritsurei* (律令) in Japanese, was an official order from the Governor-General of Formosa.

³⁶ Governor-General was the highest official as well as the head of the Formosan Government throughout the Japanese administration.

³⁷ The Draft of Taiwan Historic Materials (臺灣史料稿本), hereafter, DTHM.

Government, came from the notion that the ‘Savage Territory’ was owned by the State. Therefore, the violent pacification actions against highland aborigines became inevitable, when the authority attempted to pursue the development of the ‘Savage Territory’ for state benefits.

The documents of Rokusaburou Mochiji offer an excellent and representative example of this ideology. In the pages of *Disposal of Savage Territory* (蕃地處分), *Advisory Report for Savage Administration* (蕃政問題ニ關スル取調書) which had become one of the basis for the management of the ‘savage’ races and lands, Counsellor Mochiji agreed with Santarō Okamatsu’s (岡松 參太郎) opinion that the ‘savages’ have no land titles. Okamatsu, Doctor of Laws and Professor affiliated with the College of Laws in Kyoto Imperial University (京都帝國大學法科大學), was known as one of main participants in the *Extraordinary Taiwan Old Customs Survey Organisation* (臨時臺灣舊慣調査會) which took charge of the analysing customs and tenures relating to the Formosan Chinese residing in the plains after 1901. Thus we can see he made remarkable contributions and suggestions in the formation of civil law systems in the early administration of Taiwan (Wang, 2008: 47-95).

Citing Okamatsu explicitly as a precedent, Mochiji was able logically to sustain his point as follows. According to Mochiji, Okamatsu formed this judgement on the basis that the lawful rights should be enjoyed and protected only if a unitary organisation exists. Consequently and conveniently, the tribal peoples had no land ownership over the ‘Savage Territory’, because they had never established this sort of ‘unified organisation’ (統一機關). Mochiji then extended this argument and claimed that the private rights relied upon the creation or approval of nation or state government. He did this on the basis that:

The savages had not been under the sovereignty of Imperial government and stayed un-subdued since the Formosan annexation until recently. Therefore, the state had no opportunity to exercise the creation or approval for land ownership or any other private right (Mochiji, 1902: 14).

Someone might claim that since the aborigines have in fact occupied the ‘Savage Territory’ they should thus gain title through occupation. However, Mochiji argued that the aboriginal groups did not occupy the land in the sense of having a notion of land title but only in the sense of usufructory share-holding of tribal items (Mochiji, 1902: 14-15). Following this rationale, Mochiji further developed Okamatsu’s thesis that the ‘Savage Territory’ should be reserved wholly for state-owned grants and activities.

ESTABLISHMENT OF GOVERNING DEPARTMENTS

The middle of the first decade of the twentieth century witnessed fierce and radical changes in the government's attitude to highland aborigines. The fourth Formosan Governor-General Kodama was succeeded in 1906 by Samata Sakuma whose nine-years-and-one-month governorship marked a transition to aggressive measures towards the aborigines of the Formosan interior and their ancestral wooded country. One of Sakuma's missions was to extend Japanese control into the aboriginal regions, so he not only made efforts to re-organise the central and provincial administrative systems of Formosan Government, but also devoted himself to the pacification of the remote highlands. Accompanying these measures, the preliminary work of surveying the 'Savage Territory' was nearly completed during the Sakuma's term. These surveys, during his tenure, revealed the potential of great forest districts in Taiwan. In other words, without Sakuma's aggressive actions to the aboriginal population and territory, there would not have been the opportunity to witness and utilise the natural wealth of the 'Savage Territory'.

The colonial administrators were clearly aware of the fact that control of the indigenous population was the premise of land appropriation. The fulfilment of 'savage control' (理蕃) was assigned to an especially established government office for aboriginal affairs, which organised the punitive attacks against aboriginal peoples, and a methodical plan for subjugating the refractory groups. Several government offices which were responsible for aboriginal affairs were created one after the other, one of them even achieving an important status within the colonial Formosan administration between late 1909 and mid 1915. On the local administration level, several *Colonial Agencies* or so-called '*Savage Stations*'³⁸ (撫墾署) were instituted along the border of the 'Savage Territory' as early as in the March of 1896. These institutions were in fact obviously the revised counterparts which were inherited from the *Colonial Departments* (撫墾局) during the Qing dynasty of the Chinese regime (Fujii, 1997: 20-39). The Colonial Agencies were entrusted with the oversight of 'Savage Territory' affairs, such as gradual education and general enlightenment of the savages, management of camphor-distilling, land survey, and so on. These agencies however ended their services in June of 1898, due to their unsatisfactory underperformance in administering aboriginal peoples and land management. Afterwards, other local government offices took over the responsibility for the matters mentioned above. On the

³⁸ For example, the term 'Bukonsho (savage station)' was used in *Report on the Control of the Aborigines in Formosa*, 1911:5.

central level of the Formosan Government, as part of aboriginal affairs, the control and security of the ‘Savage Territory’ entrance were firstly transferred to the *Police Agency* (警察本署) in November of 1901. Less than one and half years later, this agency started to take over all matters pertaining to indigenous populations and their territory. One subordinate unit the ‘*Savage Affairs Section* (蕃務課)’ was constituted under the authority of the Police Agency in 1906, coinciding with the appointment of Governor-General Sakuma. In 1909, the partial re-organisation of governmental framework took place and a brand-new department of higher rank ‘the *Savage Affairs Agency* (蕃務本署)’ emerged in the central Formosan Government.

These developments evince the iron will to further the appropriation and exploitation of the ‘Savage Territory’, as is clearly revealed in the Explanatory Statements (理由書) for founding an office which was in charge of the ‘Savage Territory’ affairs in 1909. The Chief of Civil Administration, Kumaji Qshima (大島 久滿次) had this to say:

The development of the ‘savage territory’ has been productive for several years. This much is clear from for instance the extension of police cordon to a distance of two hundred ri³⁹ and the budget expenditure needed annually amounting to millions of dollars. Therefore, it is impossible to expect the completion of Savage Territory development, if such great scale affairs still to be placed under the control of the Police Agency. In addition, the works of the ‘savage territory’ policemen differ completely from their colleagues stationed in the plains. Their duties consist of not only the conduct of armed actions against the Savages, but also the promotion of a conciliation policy. Therefore, it is now an excellent time to establish the new Savage Affairs Agency (FGA/ V1454A5).

In terms of the division of sections within the ‘Savage Affairs Agency’, different sections were established and abolished at separate stages each with its own appointed tasks. At the beginning, the ‘Savage Affairs Agency’ was initially formed by the simple merger of the *General Affairs Section* (庶務課) and the ‘*Savage Control Section*’ (理蕃課). With the growth of indigenous affair noted above, and the territorial expansion into the mountains following the commercial expansion over two hundred ris, the *Survey Section* (調査課) was created in 1910, however it was incorporated into the ‘Savage Control Section’ in late 1913 (Police Bureau, 1921: 91; Suzuki, 1932: 314). Even though minor

³⁹ ‘Ri’, 里. In the Japanese distance measure, 1 ri is practically the equivalent of 2.44 miles.

adjustments occurred in the organisation of sub-offices, the Agency became the official executive department responsible for most of the 'Savage Territory'-specific matters. Of them, the 'Savage Control Section' chiefly took charge of tasks in connection with conciliation, enlightenment and pacification of native people. It was also entrusted with the work relating to the exploration and security of the 'Savage Territory'. The Survey Section was responsible for surveying and mapping of the 'Savage Territory' as well as the compiling and recording of the 'Savage title' register. Other ordinary affairs belonged to the General Affairs Section. The achievements of the Survey Section will be further analysed below, in order to explore the formation of territorial knowledge.

ENCLOSURE OF RULING SPACE

Control of aboriginal population was the premise of land appropriation. Only if the land was enclosed into the ruling space of colonial government, it was possible to expect the becoming of resources. The effects caused by pacification actions, whether the advancing of police cordons or invasive fights, led on to the remarkable expansion of enclosed control areas or bounded districts. This also meant the colonial spatial disciplines started to be implemented in the enclosure.

Control of aboriginal people was linked to the annexation of lands in highland Taiwan and further to the benefits of colonial or even national development. In a referencing material accompanied with proposal presented to the Japanese Diet, the items of resources and their spatial distribution were clearly indicated.

The consequence of the savage control will not only expand the prestige of Empire to the territory outside our current control, but also facilitate, in terms of state treasury, the enhancement of revenue, by such as the growth of cultivable land, utilisation and grant of forest products, and permission of mining districts. ...although the wealth of forest resources has not been completely surveyed, it is certain that the sort of forests which are composed of woods of excellent quality exist in Taiwan could not be found in elsewhere. ...the fertile lands enclosed by forests may be cultivated for economic plants... the mining industry is also promising, as there exists noble metallic mines, slate, petroleum and so on in northern savage districts (The Police Bureau, 1921: 16-17).

In doing so, it was possible to persuade the Diet to advocate the pacifying the aboriginal peoples at national expense. In other words, the land and resource were expected to be mobilised to promote colonial development.

Control of aboriginal people

Scientific forestry was premised on separating people from forests. In doing so, the technical engineers could daringly make plans for the highland development. This section firstly outlines the progress of 'savage control' which was commenced by Governor-General Sakuma, because this progress sets the temporal-spatial background for the forthcoming investigations and surveys. In the context of aboriginal pacification movements, the next section successively examines the feature embedded in these 'Savage Territory' surveys.

There was still a remarkable difference in spatial control strategy between the two modes. The attitudes for the control of indigenous peoples varied from the passive measure of 'savage-prevention' (防蕃) to offensive action of 'savage-subjugation' (征蕃). In the former, the police authority followed the ancient practice of surrounding the unruly inhabitants with a cordon or guard-line (隘勇線, *Aiyu-sen*). The old cordons were constructed originally by local gentries and entrepreneurs to protect their farms, estates, and plantations in borderlands. It is no coincidence these areas of early policing, containment and protection had had been camphor-producing districts since the late imperial Chinese administration. Scattering along the edges of the 'savage districts' in North and Central Taiwan, there were a great number of boilers and manufacturing equipment for camphor, known as camphor distilleries(stills)

Up to this point, however, the chief consideration of the police cordon maintenance was to protect the villages bordering the 'savage districts' and to guard the camphor estates. In 1895, namely the year the colonial administration commenced, the Japanese government began to subsidise the operation of existing police cordons at the 'savage borders' in Toyen (桃園), Taichu (臺中), Nanto (南投) districts. Six years later, much more active efforts were made by the government. For example, the director of relevant offices, such as County Magistrate (縣知事), took over the police cordon management and furthered its coverage through the northern and central Taiwan (Police Agency, 1918: 236-238).

In the latter periods, the police began to penetrate the territory with an enhanced force and established a series of posts strong enough to maintain themselves in suitable localities, such as the gates into the 'savage districts'. Dozens of conflicts, encounters, and fights took place, here and there, in the 'Savage Territory'. In addition, the colonial government deployed the latest technology for military defence, *electrified wire* (電流鐵條網) which had been established at some important gates or sites since 1905. It prevented the

aborigines passing through from the blockaded areas.

A methodical plan for subjugating the refractory ‘savages’ was put into force between 1910 and 1914. Although Samata Sakuma had promoted eighteen rounds of guard-line advancement during the first four years of his term (Sugiyama, 1922: 174-175), he was not fully satisfied with the results and further attempted to develop a more proactive and aggressive strategy. The Governor-General and Civil Governor endeavoured to persuade the Imperial Diet to vote funds for their Five Year Savage Control Enterprise (五箇年計畫理蕃事業). In a report presented to the Budget Committee in Tokyo in about 1906, the Chief of Civil Administration, Tatsui Iwai (祝辰巳), demonstrated that:

The Island of Formosa has an area of over 14375 square miles, of which the area occupied by the aborigines measures 7500 square miles. Of this area 2500 square miles has been brought under control, but the remainder has to be dealt with, and its population is estimated at 30000. Against these 30000 aborigines a body of 5000 aiyu (border police) is employed, its non-commissioned and commissioned officers being Japanese and numbering 600. The employment of these mixed troops is not a matter of economy only. Experience has amply shown that it is impossible to employ a force of regulars in such regions as those inhabited by these aborigines. The plan pursued is to keep troops in reserve and to employ the aiyu in the van. It would be possible to bring the whole region under subjection in the course of a couple of years, but considerable loss of life and treasure would be entailed. All things duly considered, deliberation seemed the wisest programme, and the Government's intention was to devote five or six years to the task (Iwai, 1907: 12).

Surveying of lands in the Savage Territory

‘Savage Territory’ Surveys (蕃地測量) were termed as *Topographical Surveys* (地形測量) in a narrow sense, but they also comprised many other surveys or investigations which were conducted by the industrial authorities, transportation offices, and public work departments covering many wider issues than just land form features. The narrowly-defined ‘Savage Territory’ survey played a crucial role in the demarcation, definition and economic development of the ‘Savage Territory’ and its disciplinary effects are clear from it being practiced through the operation of police authorities. On the one hand, the fundamental influence of the ‘Savage Territory’ surveys and ‘savage’ condition investigation on the development of aboriginal population and territory had been attached importance in the momentous advisory report which was contributed by Rokusaburou

Mochiji (Mochiji, 1902: 49-50). On the other hand, the priority of topographical survey among all of the investigations was even extra emphasised by Engineer Nei Noro (野呂寧) in several articles presented in the *Taiwan Times* (臺灣時報) and other publications (Noro, 1910: 15).

‘Savage Territory’ surveys organised by police sectors pioneered a range of investigations and techniques in the late 1900s. As part of forceful ‘savage-control’ policy, the ‘Savage Territory’ survey or the ‘Savage Territory’ Land Survey (蕃界土地調查) commenced in April of 1908. This work was at all times under the control of police organs of the Formosan Government. It was initially the ‘Savage Affairs Section’ (蕃務課) of the Police Agency (警察本署) that was in charge of the Savage Territory survey, then the Survey Section (調查課) of the ‘Savage Affairs Agency’ (蕃務本署) succeeded in that duty after late 1909. The disbandment of the Survey Section took place in 1913, but the relevant survey tasks were still left in the hand of offices within police departments.

Except from the internal exchange networks within the Formosan official departments and offices, the ‘Savage Territory’ information, whether racial or territorial, was also circulated through the activities of some official associations and semi-official groups. These organisations made it possible to disseminate the knowledge about the aboriginal population and territory more broadly and efficiently. For instance, the monthly-based newspaper the ‘*Taiwan Times*’ and short-lived transactions of the ‘*Savage Frontier*’ played a significant role in terms of knowledge circulation. The former, the *Taiwan Times* (臺灣時報, *Taiwan Jiho*) was released by the *Taiwan Branch of East Seas Society* (東洋協會臺灣支部) and was a semi-official and well-circulated periodical magazine within the press and populace of Taiwan. Founded in 1908, the *Taiwan Times* had the duties to declare and promote the government policies as well as to help advertise the administrative achievements of the Government. Although the reported texts and plates were not confined to the aborigine-related issues, up-to-date conditions pertaining to aboriginal population and significant events that took place in the ‘Savage Territory’ were extensively documented, presented and propagated in this publication, comprising the majority of its reports. The latter, the ‘*Savage Frontier*’ (蕃界, *Bankai*), was the bulletin released by the ‘*Savage Research Group*’ (生蕃研究會), and was designed specially to exchange the knowledge relating to the savage people and land as well as to introduce the conceptions to the public furthermore.

Dual positions of colonial officials in both government departments and private

organisations helped to communicate ideas between diverse spheres. Nei Noro, for example, held concurrent posts in separate public offices and services in this period. Not only was Noro appointed to the leading post for mapping and surveying affairs in governmental offices, but he also occupied influential positions putatively ‘civil’ organisations, such as honorary secretary and editor in the Taiwan Branch of East Seas Society and the ‘Savage Research Group’, for a long time. In other words, it suggests that these government departments and apparently private bodies were linked by crossovers of officers and staff and consequently worked with related information and related goals to some extent.

This sort of survey was not only the extension of the Land Survey which was conducted in plain countries of Formosa during 1900-1904 in the narrow sense of covering more of the land mass with the same property survey, but also the initiation of surveying and mapping conducted in the centre island in the broad sense of an assessment of potential resource of different kinds. The plains Land Survey is essentially cadastral, property demarcation and, thus, revenue survey, it was rather several topographical surveys that were undertaken in the ‘Savage Territory’ in the following years. In addition, small scale trigonometrical surveys with a higher accuracy and precision were implemented in the ‘Savage Territory’ as late as 1929 by the Ordnance Survey (陸地測量部) based in metropolitan Japan (Ordnance Survey, 1932: 377-378).

Apart from the chief for surveying offices, most of the actual surveying and mapping work was assigned to technical staff. Generally, the head of the Survey Section was one of higher ranking police officers, *Superintendent of Police* (警視), in most cases. The reason why higher grade policemen led this office was that they oversaw the original responsible officers that were brought under police authority and the new section became an extraordinary and temporary unit after 1909 which required a senior officer to exercise strategic control while its technical staff oversaw operations. Thus, the personnel of technical staff typified as *Engineer* (技師), *Technician* (技手) and *Appointee* (囑託). Generally or typically, engineers set the plan for surveying and directed the work, while technicians performed the actual operation. Moreover, a number of Appointees and *Clerks* (雇) would be officially assigned to surveying work. Appointees, who were often full-time staff affiliated to a specific government office, were sent to another department in order to do a different job for a short period of time, while Clerks were the contract employee of a given unit at all times. Engineer Nei Noro was one of the chief surveyors who took charge of ‘Savage Territory’ survey, while Technician Kyohei Takaratsu (財津 久平) became one

of Noro's loyal and experienced assistants serving from the start of the survey work.

In addition, it is interesting to note that in some of surveying schedules the Photographers (寫真手、寫真師) were invited as members of the investigation team too. This kind of arrangement was not only to create a display of how extensively aboriginal people were being subjugated for the edification of enthusiastic officers and the populace of Japan, but also exhibitions of highland landscapes (Plate 4-1). For example, selected topography, vegetation and settlement were shown to the public. That these apparently innocent pictures of topography were enabled by and enabling of the violent processes of subjugation, both practically and symbolically/psychologically. The pictorial images which were taken by professional staff were inset into articles served for public or reports submitted to government offices, as well as being compiled into special collections. The former sort of illustrations could usually be found in Engineer Noro's reports.



Plate 4-1 Mt. Nanko showing it was then covered by dense coniferous forest

Source: The Peak of Mt. Nanko (南湖大山の絶頂), Taroko Tribes Pacification Photo Album (太魯閣蕃討伐寫真帖). Institute of Taiwan History, Academia Sinica, Image Collections of Taiwan under Japanese Rule, 1895-1945, (hereafter ITH Image Collections) B0130_00_00_0106_a03

The conduct of these topographic surveys had to be protected from the indigenous attacks on the one hand, but was also dependent upon aboriginal assistance on the other hand. The complicated interactions and entanglements between the survey teams and the

relevant ‘savage tribes’ took place in nearly all of surveying actions. The surveying teams were usually organised by dozens of participants, such as professional surveyors, police forces, Chinese guardsmen and coolies, and aboriginal guide men. They had their own duties respectively. The arrangement was not only regulated in the instructions for the ‘Savage Territory’ survey but also practised by field workers on the ground. The sort of personnel list had become the standard cast since long before. A typical set of scenarios were documented in a series of reports and an accompanying photograph collection concerning the progress of the ‘*Taroko Savage Pacification*’ (太魯閣蕃討伐). The ‘Taroko Savage Pacification’ was formally conducted between May and August in 1914, though the preliminary work of *exploration-based surveying and mapping* (探險測量・測圖) had been commenced beforehand.

The actual and normal conditions of surveying work can be typified using Takaratsu’s case. The purpose of Technician Takaratsu was to investigate the regional topography and the aboriginal tribes’ distribution in the upper *Mokkui* (木瓜溪) Valley which is located south of what by then was classified as the inner *Taroko* ‘savage tribes’ (內タロコ蕃) district. The illustration (Plate 4- 2) below shows Kyohei Takaratsu practising the ‘Savage Territory’ survey at the top of the *Mabayan Heights* (マバヤン高地) in October of 1913. Mabayan is a divide between the upper Mokkui Valley and one of its northern catchments. As a technician Takaratsu was equipped with binoculars and was conducting the surveying and draughting the maps. Like most of his colleagues would have been, Takaratsu was surrounded and guarded by several policemen and guardsmen when performing this kind of duty.

The surveyor’s journal was not made by his free will or leisure purpose, rather were modified from his progress diary for surveying job. The surveyor’s emphasis on physical environments or human landscapes situated in highland Taiwan was usually another form of state concern. Engineer Nei Noro provided several excellent cases. The great formative texts of Taiwanese highland geography were made by Nei Noro, because he was always the first one who made a sortie into the unfamiliar and unexplored districts. These sorts of earliest descriptions not only unveiled the mysterious highland landscape to the public but also conveyed the governmental interests which were represented by civilian technicians operating in the ‘Savage Territory’ conditions. Although Nei Noro had a colourful official career in his service in the Formosan Government, our attention here is drawn to his achievements of ‘Savage Territory’ survey. Under the leadership of Nei Noro, a range of the ‘Savage Territory’ surveys were conducted and related documentations, journals, and

reports were produced.



Plate 4-2 The 'Savage Territory' survey in *Mabayan Heights, Mokka Valley*, 1915

Source: Mabayan Heights, Taroko Tribes Pacification Photo Album. ITH Image Collections, B0130_00_00_0033_a01

The assignment of offices and personnel which were entrusted with the surveying duties reflected the imposition of the desires of the Formosan Government upon the environment. The sort of environmental investigations commissioned at all times started from topographical, route and resource surveys. Undoubtedly, some fieldwork at the very beginning simply aimed to make measurement of the distance and relief featured in the highland countries. However, increasingly inspections tried to ascertain the existence or otherwise of forestry and mineral productions suitable for public use or available as a resource. The principal purpose of still other investigations was to seek any available means of communication and transport between the East and West Formosa through 'Savage Territory' to enable those resources to be brought within the circulation of capital and the reach of the colonial state. These surveys helped to co-construct the environmental image regarding highland Taiwan.

The quick survey which was conducted through a series of armed expeditions could not deliver a high level of detail. More than once there are examples where the limits of

colonial knowledge and control were apparent. For example, the *Map of Northern Savage Territory* (北蕃圖), was drawn in the scale 1: 200000, and was completed in June of 1909 and released in November of the same year. Although it took merely two years to undertake the surveying and mapping, the area covered was range from Dai-nan-o to Bak-ran and parts of southern ‘Savage Territory’ (Noro, 1910: 16), that is almost one-fourth to one-third of the whole ‘Savage Territory’ acreage. Therefore, it is not difficult to imagine the quality the map may present. The notes at the bottom of the map states frankly that:

There are some contents which were not made on the basis of field surveys. Little accuracy of information or measurements is guaranteed in considerable parts of this map, because they were surveyed through eyes. That means the surveyors in some cases were forced to estimate distance or extent by the naked eye, with the exception of the areas along the police cordon (Police Agency, 1918: 694).

Not always but usually, the topographical survey teams which were conducted in the ‘Savage Territory’ were accompanied by the civilian foresters and government geologists. Through rather more surveys conducted by the civilian technicians who were trained in the forestry and geological sciences across the ‘Savage Territory’, the scattered specimen and samples as well as traverse-based information about landscape were gradually developed forward or refined into the totalising knowledge of environment. In other words, a much clearer environmental picture relating the ‘Savage Territory’ was developed.

Examining the conduct and impact of the topographical-based expeditions has contributed to this section of my thesis, which maps the epistemology of the governments and their knowledge to the distant ‘Savage Territory’. By investigating the networks of knowledge and administration, the thesis suggests that the focused areas exploration implied an understudied and key starting point for the generation and circulation of knowledge framing policy development. On the basis of the relatively systematic and intentioned demarcations conducted in parts of ‘Savage Territory’, the next section will aim to explore the will of Formosan Government to govern highland Taiwan.

FRAMING OF DEVELOPING STRATEGY

Systematic definition and demarcation of lands in the interior of Taiwan followed the pacification of most ‘Savage Territories’. However, the widely-accepted narrative that the ‘Savage Territory’ lands should be possessed by the State, discussed in the previous section does not necessarily mean that a variety of industrial operations followed in the ‘Savage

Territory' should also be practised by the colonial authorities. Furthermore, the land utilisation in highland districts had been shaping itself during the formative eras, although both forest investigations and mineral surveys were conducted equally and played a critical role during the previous periods of aboriginal pacification. In the forthcoming, we will see the vision of resources in the forest surveys that captivated the Japanese state. As a result, it was the perspective which based on forestry instead of that rooted in mining that was elected and adopted by the Japanese authorities. Most resource was invested in the forest offices rather than mining ones, leading to a recursive strengthening of staff employment and the promotion of forest surveying. It was the second decades of the twentieth century that witnessed an obvious shift in the industrial strategy of 'Savage Territory' and thus the forestry-based highland demarcation underway.

Various types of forest surveys on the basis of sub-divisions, usually watersheds or catchments were conducted systematically by the Forest offices which employed numerous staff and were granted huge budgets. This surveying enabled the configuration of knowledge about highlands and vegetations gradually as well as laying the foundation for forest management in the forthcoming decades. Through the organisation of specialist forums for the circulation and peer discussion of ideas and their subsequent publication, more comprehensive forest discourses were drawn up from masses of separate and fragmented information about, such as the tree species, relief and elevation, and ecological location. As well as depicting the physical landscape of forest components and land conditions, many assessments were also delivered on the present state and future allocation of aboriginal races. According to the Formosan Government, the insight, sweeping, and reasonable highland demarcation which based on the three-land-classifications principle was open to the public eventually in the mid-1920s when the *Forest Planning Enterprise* was started.

The Mining offices, by contrast, had enjoyed limited success in formatting the environmental knowledge by the 1910s and 1920s. The demands for geological survey were all but ignored. In general, and doubtless in part because of the relative small size of mining offices, only minor mining and geological surveys were conducted in this organisational structure. However, the most important and essential problem was that the chief mission of Mining offices was to deal with the administrative and managerial affairs instead of being to undertake actual surveying tasks. Most of their mineral surveys (not geological surveys) were conducted as subordinate and quick investigations along with the rest of those inspectors' work. Sometimes, the staff of Mining offices were also entrusted with the surveys for other departments' engineering work, such as construction works and

irrigation schemes and these created opportunities for geological surveying of specific sites. In addition, some blanks in the mineral or geological knowledge had been filled by the support of metropolitan departments and private companies elsewhere. Insufficient budget and weak personnel which reflect the intentional ignorance of the Government limited the development of a comprehensive geological mapping and classification for the ‘savage territory’ or highland Taiwan.

To demonstrate this, this section firstly looks at the Japanese administrative interests and preference in terms of industrial strategy in highland districts, through mainly the comparing of forestry and mining departmental sectors. Under this industrial strategy framework, it continues to examine the features of forest surveys conducted since the mid 1910s and at the same time focuses its analysis on their purposes and the chosen areas of surveying.

Highland Industrial Strategy

The Japanese administrative interests and preference in terms of industrial strategy relating to mountainous regions rested chiefly on forestry development. This partly reflects the fact that Japan, as a main timber-consuming nation, always worried about the sufficient supply of timber. The forestry-based industrial strategy which was implemented in highland Taiwan was both helped by defining and demarcating the aborigine-occupied part of Formosa and helped to define and demarcate them. But we have no idea why the dominance of forest industry in the hilly countries became so dominant in policy terms. No direct evidence available in the archives explains why the Government preferred to develop forestry rather than to facilitate the mining in the mountainous districts of the island. However we can draw some inferences from an analysis of the personnel of industry-related departments which could provide indirectly some information on the aims and strategy of the Government.

Government strategies were reflected in the establishment of industrial offices. Both the Forest offices and Mining departments were reformed in 1905 but they experienced a differential role in the way in which the Government opened up the ‘Savage Territory’. That is the enlargement of administrative and technical staff occurred in the forestry sector rather than mining division (Table 4-1). Both of these two government offices had initially been established as official sub-units, namely the *Mining Section* (鑛務課) and the *Forest Section* (林務課), under the overall aegis of the *Board of Production* (殖産部) in the *Civil Service* (民政局) immediately after the Japanese appropriation of Formosa island. In 1898,

as results of the administrative adjustment, both the Mining Section and the Forest Section were absorbed into the *Colonisation Section* (拓殖課) at the same time. Seven years later, the aforesaid two Sections were independent again, but after that point the discrepancy in their staffing levels began to emerge.

The figures in Table 4-1 support the argument that there was much more staff to create knowledge in the Forest Section than in the Mining Section. This not only reflects that the policy emphasis of the Government on the highland industries, but also enabled, and may also reciprocally reflect that, the members of the Forest Section could access the 'Savage Territory' more easily and frequently. The Forest Section had a larger staff than the Mining Section at all times in the period 1906-1917. It even had more than double the personnel as compared to the Mining Section after 1910s.

On the contrary, staffing levels in the Mining Section stagnated. Hardly any addition was made to the administrative and technical staff of Mining Section during the years when the Forest officers were eagerly expanding arboreal knowledge through surveys in highland Taiwan. In this long period, the Mining Section remained at seventeen or eighteen members (Table 4-1). Even worse, a heavy staff reduction was made at the end of 1924 due to the great administrative reform within the Formosan Government. The original Mining Section was downgraded to a division which was affiliated with the *Section of Commerce and Industry* (商工課). This arrangement further de-prioritised the Mining officers' work.

Occasional specific increases in workload demanded the enlargement of personnel in the Mining Section too, but overall the numbers of members of this office were far fewer than the Forest Section. In order to recruit needed staff, for example, for exercising the mining inspection and for conducting the mineral and geological surveys, one Engineer, two Officers, and five Technicians in May, 1918 and one Engineer and two Technicians in May, 1919, were added into the staff of the Mining Section respectively (DTHM 1918/1919).

The quick investigations appended to other projects constituted the main part of the Mining officers' work, due to a lack of capital for investment in mining industry. Whilst the mining offices had been charged with the administration of mining industry constantly, since the release of the *Taiwan Mining Regulations* (臺灣鑛業規則) not long after the beginning of the Japanese administration, the demands for a geological survey which could properly contribute to the environmental conceptions formation were all ignored. The subordinate surveys essentially were so unsatisfactory that Yuichi Ichikawa (市川雄一) who was appointed in the Mining authority still had to struggle to advocate the geological surveys as late as 1925, although the Mining offices had been formed for thirty years.

Table 4-1 Comparison of Staff Numbers in the Forest Section and Mining Section

	Forest Section						Mining Section					
	Engineer	Technician	Officer	Appointee	Clerks	Total	Engineer	Technician	Officer	Appointee	Clerks	Total
1906 (M39)	2(0)	4(2)	1(0)	2(1)	3(1)	12(4)	1(1)	2(2)	1(1)	1(1)	3(2)	8(7)
1907 (M40)	3(1)	5(2)	2(0)	4(1)	8(6)	22(10)	2(1)	3(3)	1(1)	1(1)	2(2)	9(8)
1908 (M41)	5(1)	6(2)	3(1)	9(5)	14(14)	37(23)	2(1)	5(5)	1(1)	0	2(2)	10(9)
1909 (M42)	7(2)	6(4)	5(2)	17(8)	16(16)	51(32)	2(1)	6(5)	2(2)	4(3)	3(2)	17(13)
1910 (M43)	9(4)	10(7)	7(4)	22(13)	18(18)	66(46)	3(2)	7(6)	2(2)	5(3)	4(4)	21(17)
1911 (M44)	5(4)	5(4)	5(3)	1(1)	13(12)	29(24)	3(2)	7(6)	1(1)	3(1)	7(7)	21(17)
1912 (M45)	6(4)	9(5)	6(4)	1(1)	17(17)	39(31)	4(2)	7(6)	2(2)	1(1)	8(8)	22(19)
1913 (T2)	6(4)	7(4)	7(3)	1(1)	21(18)	42(32)	4(2)	5(4)	1(1)	0	5(5)	15(12)
1914 (T3)	7(5)	7(4)	7(4)	1(1)	31(27)	53(41)	4(2)	5(4)	1(1)	0	7(7)	17(14)
1915 (T4)	6(3)	5(3)	6(3)	2(1)	18(15)	37(25)	4(2)	5(4)	1(1)	0	7(7)	17(14)
1916 (T5)	6(3)	5(3)	7(4)	2(1)	11(11)	31(22)	5(2)	5(4)	1(1)	0	7(7)	18(14)
1917 (T6)	5(2)	7(2)	5(3)	1(1)	14(14)	32(22)	5(2)	5(4)	1(1)	0	7(7)	18(14)

Source: The Formosan Government Civil List (臺灣總督府文官職員錄), 1906-1917

Note: 1. M39 means the Meiji 39th year, while T2 refers to the Taisho 2nd year

2. Number (number) = total staff/ full-time staff

Ichikawa compared the progress of geological survey in Japan, Korea, and Taiwan and suggested that a proper geological survey department should be established in order to facilitate a variety of industrial developments (Ichikawa, 1925: 20-32). Despite their limited support from the Formosan Government, the Mining officers did locate some major resources that in turn led to some prosperous mines, such as colliery sites, petroleum reserves and metallic or non-metallic mines. These mining districts then unsurprisingly became the spatial focus where further mineral or geological surveys were undertaken. Only less than a dozen categories in Taiwan were exploited as economic mines of value, although a minimum of sixty nine minerals were discovered by the Japanese civilians and specialists.

The chief mission of Mining officers was to deal with the administrative and managerial affairs once mining had commenced rather than taking charge of exploratory surveying tasks. Therefore, the conduct of mineral or geological surveys are almost entirely confined within the prone mineral and mining districts as officers added some small surveys onto those administrative tasks. The book by Takahashi and Ichikawa concluded and indicated the main order of important mines, which provided the data from which was compiled. For colonial authorities and industrialists, mineral resources or economic minerals meant chiefly the gold and fuel minerals.

The small scale of mining officers implied the limited results of their responsible work. Most of their work was thus devoted to depict the current condition of mining industry that the interests of the colonial authority laid. There was no distinct difference in most of the ruling period. In 1926, for example, one year immediately after the completion of preliminary geological surveys island-wide, Harukichi Takahashi (高橋 春吉), a mining Engineer affiliated with the Section of Commerce and Industry, and Yuichi Ichikawa, a geologist appointed by the same department, indicated the mineral importance to colonial Taiwan. They wrote in the prologue to their *Part Three Mineral Resources in Explanatory Statements of the Map of Geology and Mineral Resources of Taiwan (Formosa)*:

In terms of mining block numbers and acreages, the coal fields occupy eighty percent and others are termed as copper, lode mines of gold and copper, petroleum, and alluvial mines of gold in order. In terms of distributing areas, the coverage of metallic mines range from the far north to the east of this island.

(Takahashi and Ichikawa, 1926: 46-47)

A similar but slightly modified statement was made five years later on the basis of changing sequence in the extracted mining weights.

In terms of mining block numbers and acreages, the coal fields occupy eighty percent and others are termed as petroleum, copper, lode mines of gold and copper, and alluvial mines of gold in order.

(Tropical Industries Survey Organisation, 1930: 1-2)

Another example also helps to demonstrate the weak personnel of mining authority in colonial Taiwan. Severe deficiency of mining staff meant that they were forced to search for metropolitan assistance whilst there was a need for large scale mines prospecting. Clearly in the changing economic contexts the resources around it had risen in importance for the colonial Japanese administration and economy. Of necessity for the measurement of mineral resources the Mines Department would seek assistance from other departments, such as the metropolitan governmental institutions or private mining enterprises, to conduct surveys. Two cases are provided about the prospecting of oil fields and the discovery of metallic mine lodes in the ‘Savage Territory’ respectively. Although its dominant distribution area is not within the ‘Savage Territory’, the example of petroleum supports the argument that scarcity of Mining staff resulted in the underachievement of that department in undertaking geological or mineral surveys in all areas. To secure the supply of fuels for naval purposes was a major economic and policy driver and thus coal mines and oil-fields became the primary interest in succession. The prospecting of oil fields could not be completed without the support of metropolitan departments. The preliminary oil-fields survey was made by Kinosuke Fukutome (福留喜之助), the Chief of the new Mining Section, between 1904 and 1905, but it was not very successful or useful. According to Engineer Fukutome, the unsatisfactory surveys were due to the lack of experienced oil geologists and the other tasks of mining officers (Fukutome, 1910: 1-2). Another round of detailed surveys was furthered by a group of Engineers and Technicians who were affiliated with the *Geological Survey*, under the *Ministry of Commerce and Industry* (商工省 地質調査所) in metropolitan Japan in 1927. As early as the mid-1910s, the petroleum fields in southern Taiwan had not been completely explored but the possible resource had been reserved for naval use (Kuro, 1917: 7). The experts who were represented by Yoshichika Oinouye (大井 上義近) and Yoshinosuke Chitani (千谷 好之助) took about half a year to estimate the oil stock in Taiwan (Marine Ministry, 1928: 1-2).

Various teams of engineers, on the other hand, were employed and organised to conduct measurement of mines in 1916 by several mine-owners or private enterprises, such as the Mitsui Bussan Company (三井物産會社), the Kuhara Mining Company (久原鑛業會社), the Fujita Corporation (藤田組), and the Ensuiko Sugar and Development Company (鹽水

港製糖拓殖會社) (Bureau of Productive Industries, 1917: 211; Police Bureau, 1921: 295-297).

CONSTRUCTION OF FORESTRY ENVIRONMENT

Through a few forest discursive operation, the experiential categories which derived from forest surveys in the field were transformed into manageable Reserve-Forest System.

Forest Surveys

Forest surveys triggered by local civilian officers after the 1910s declared the formal demarcation of forests in highland Taiwan. If the explorations of a variety of disciplines in Formosa in the Tokyo Imperial University-based period were mainly geared towards satisfying the demands of metropolitan science, the period after the 1910s saw a dramatic shift in the motives and procedures of investigations, with the emergence of civil offices in Taiwan. In the past, the metropolitan explorers were especially interested in scientific classification of forests, such as Seiroku Honda (本多靜六). Honda, an expert focusing on silviculture, developed 'Forest Belt' concept (Honda, 1901). However, the local foresters made expeditions which concentrated upon specific resources and the possibility of their utilisation. Most important of all is that the later forest surveys covered almost all valleys, basins, and watersheds around the interior of Formosa.

Spatial scale of forest surveys framed the forest demarcation or subdivision in highland Taiwan largely and deeply. The desire to make good use of the forests around the Island resulted in a series of forest surveys. The proposal of exploiting the insular forests of Taiwan was made in 1914; accordingly the forestry authority started its surveys in the promising forests areas of *Hassensan* (八仙山) and the *Giran Dakusui* (宜蘭濁水溪) Valley in the same year. Between 1916 and 1930, the Forest Section conducted twenty-two Forest Surveys each based on catchments.

The significance of this decision on scale laid on not merely partitioning the forests into fragments but also determining the way by which the colonial state control and access the highland region. This decision projected undoubtedly the colonial authority's forestry-based land strategy. That means the conditions of timber transportation became the prime factors to determine the possible exploiting spatial system. Because the most convenient transporting type available contemporary was the river system, the forest management units naturally tended to fit with the watersheds. Some surveys were undertaken by single drainage basins, while other investigations were carried out by combining several smaller valleys (Bureau of Productive Industry, 1931: 15-18).

Altogether the following forest surveys and forestry practices always conformed to the scale of catchment units.

A series of institutional and systematic overland forest surveys which were on the basis of watershed had been undertaken by the Forest Section since the mid-1910s. The drainage-basin based surveys focused respectively on several aspects, such as basic forest facts and human activity information, management and logging planning, comprehensive conservancy and so on (Bureau of Productive Industry, 1937a: 4-5). They were promoted energetically by the Forest Section successively as techniques for knowing the resource potential of an area. Among them, the *Forest Surveys* (森林調査) played an important role in the formation of forest or forestry knowledge. Forest Surveys were not only always conducted earlier than other surveys, but also outlined the forest landscapes. They delivered preliminary understandings, including the land condition, tree species and aboriginal activities. Most important of all is that subsequent forest surveys were proceeded within the framework set by the Forest Survey. The Forest Surveys were conducted to cover the majority of the ‘savage territory’ as large as possible. The coloured districts in Figure 4-1 represent the areas where the Forest Surveys were implemented.

One of the results produced by the numerous forest surveys is the classification of forest landscapes in highland Taiwan. Carrying the lens of forestry development, some typical landscapes were perceived, documented by forest surveyors and conveyed to the public afterwards. According to the Bureau of Productive Industry, the Forest Surveys aimed to explore the attributes of forests, such as location, relief, species, and volume. These figures would be beneficial to the exploitation and utilisation of woods (Bureau of Productive Industry, 1937a: 4).

The detailed instructions for the Forest Surveys are no longer available, but the required documented-items for these investigations can be inferred from a close reading of still extant survey records. For instance, Sozo Nakai’s (中井 宗三,) survey in the *Kinajii* tribes vicinity provides an example of one of the early surveys. Engineer Nakai presented a report after his survey journey which was made between 23rd of September and 9th of October in 1913. He not only wrote down the land condition, forest condition, woodland distribution, and tree species stock clearly, but also assessed the feasibility of forestry development in two separate tributary watersheds of *Yabakan* (ヤバカン) Valley and *Marikowan* (マリコワン) Valley. In terms of woodland stock especially, apart from the broadleaf forest, the coniferous forest, and their mixed forest, Nakai also segregated and indicated the open land, aboriginal cultivation and grassland (FGA/V5686 A2).

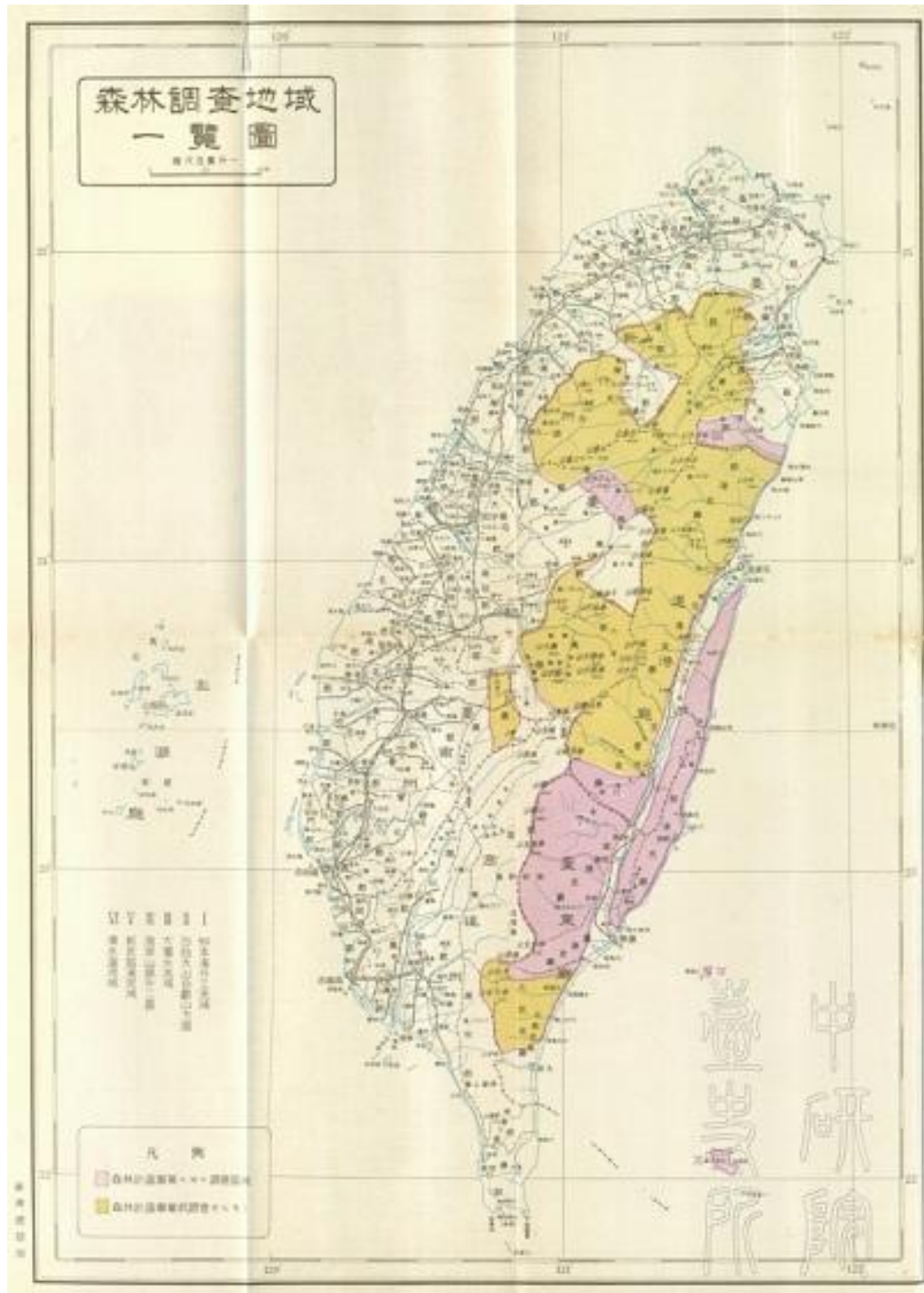


Figure 4-1 The Forest Survey Areas

Source: ITH Image Collections, originally The Bureau of Productive Industry, the Formosan Government, 1937b, *Report for the Forest Planning Enterprise* (森林計畫事業報告書), Vol.2

The experiential categories which the surveyors developed between 1916 and 1930 transformed into and constituted the common forest categories prevailed in the forthcoming decades. The varieties of forest encountered during fieldwork were normally reduced to three categories by the final report, consisting of the timberlands (供用林), the forest to be reserved (保安林), and the ‘savage cultivated patches’ (蕃人開墾地). This preliminary classification was then inherited by subsequent foresters. They employed and

modified this forest-categories concept or land-categories idea more specifically, to make sense of highland forests and further manage them (Bureau of Productive Industry, 1931: 62-63). This had crucial influences on the ideology of forest to be reserved or not and thus formed the Reserve-Forest System. This system created three connected or corresponding forest categories, namely the Reserved Forest (要存置林野), the Non-Reserved Forest (不要存置林野), and the Quasi-Reserved Forest (準要存置林野). The implications of these terms will be developed as below. For this reason, we suggest that the Forest authority which was represented by its forestry experts and technicians intentionally had begun to define and demarcate their controlled forests, in order to further exploitation since the mid 1910s.

Forest Discourse

Forest discourse is a definition and translation of forests and their related elements. In terms of colonial dependency, it in fact projected the will and purpose of the authority. Some discourses about the forests in highland Taiwan had gained prominence whilst the Japanese pacification of ‘Savage Territory’ was occurring. In this light, the elements which constituted collectively the forest landscape that date were re-organised and relocated without interruption. These separate but interlocked discourses can be characterized as comprising the following elements or tropes: the ‘*savage squatting*’ (蕃人濫墾) or thus occupying land not belonging to them, the *conservancy of forest and river* (治山治水), and the *economic lumbering*. These key motifs were integrated and galvanised the formation of the two overall Forest Planning Enterprises (森林計畫事業). Between 1925 and 1942, the Governor-General had appropriated a considerable amount of money in the budget of the continuing fiscal years for the establishment of comprehensive forest management schemes around ‘Savage Territories’. A total of 3,134,000 Japanese dollars was to be expended on the first Forest Planning Enterprise which spanned over a decade. The target coverage areas of this investigation spread about 101600 ko⁴⁰ (甲) over ten years.

This motif and category of ‘**savage squatting**’ (蕃人濫墾) became one of the keynotes or themes in forest planning and management and was propagated furthermore through discourses delivery of several forestry participants. The idea that arbitrary agricultural expansion of aborigines was closely linked to deforestation had been formulated a long time ago. Domestic foresters in Taiwan blamed the aboriginal races for felling a great acreage of trees to cultivate their crops all the time. That the metropolitan foresters were

⁴⁰ In square measurement, the ‘Ko’ is equivalent to 2934 Japanese taube, or 2.3967 acres.

impressed of the impact of ‘savage squatting’ on Taiwan’s forests as early as in the late 1900s is evident through some reports made by practical forestry administrators in the island. For example, Naoji Kada (賀田 直治,) who was Director of the *Forest Section* (林務課) at that date, was invited to give an augural speech which aimed to introduce the Taiwan situation of forests or forestry to the enthusiasts in an annual general meeting of the Japan Forester Association, held in Akita (秋田), Japan in January of 1909. He stated,

The current states of degraded lands or lands not covered with forests are mostly resultant from the savage activities. They fired the forests and cultivated the cleared lands for agricultural, husbandry, or re-forestation uses (Kada, 1909: 70-74).

Aborigines were frequently described as having the dual characteristics of forest guardians and forest destroyers. This discourse could be exemplified in the analysis by Sadakuma Azebu (安詮院 貞熊). Azebu was very familiar with the forestry affairs, having served in the Forest Section for more than ten years. His efforts to systematise and scientifically manage the colony can be exemplified in his suggestion that the spatial arrangement of forestry in Taiwan should follow the *Thünen Rings* modelled by German spatial economist, Johann Heinrich von Thünen. Inspired by his own field observations in central Highland Taiwan, Azebu asserted that the southern side of the mountain presented an un-forested appearance, as the aboriginal population conducted shifting cultivation there. By contrast, the northern side of the mountain is still covered by virgin forests, as the lands there are not suitable for cultivation. He naturally linked the ‘savage squatting’ with the *forest degradation* (Azebu, 1923: 11). Thus, the foresters were inclined to make a correlation between the abundant wealth of forests and the scarcity of aboriginals. Tayemon Ito (伊藤 太右衛門), for example, delivered a similar discourse in an article entitled as ‘*The True Forest Condition in Tamsui Valley*’, which can be summarised as follows: *Because the highland districts are not suitable for agricultural reclamation and development, there exists a small population of savages and consequently a large acreage of forests* (Ito, 1923: 40).

The belief that there were intimate links between the forest conservation and flood control was also prevalent in contemporary foresters’ circles. Tayemon Ito was also an experienced forestry administrator but paid his attention to the *Conservancy of forest and river* (治山治水) issues. Conservancy means that the official conservation of trees and soil and rivers etc. Ito was one of the enthusiastic advocates of this scientific outlook on a range of occasions, such as delivering lectures in seminars held by provincial governments and publishing related articles and volumes. For example, Ito provided some statistics to support his argument of close correlations between the conservancy and flood prevention

in several seminars respectively which aimed to educate or instruct forester freshmen in the *Shinchiku* Province (新竹州) (Ito, 1928; 1933; 1934a).

Through a series of publications, Ito also advertised his long-held belief that the existence and conservation of forested vegetation would be crucial to flood prevention and land protection. Ito published a steady stream of articles connecting the forests to precipitation and flood patterns, such as *Forest Reserve and Flood Prevention* (保安林與治水), *Effect of Forests on Water Conservation* (水源涵養に對する森林の效果), *Forest Functioned as the Water Adjuster* (森林の渴水及洪水に對する機能), *The Policy on Conservancy of Forest and River* (治山治水に關する對策) and so on. In addition, he also contributed lengthy sections in a general book relating to Taiwan's forestry development history (Ito, 1929).

Last but not least, the *Economic lumbering* should not be neglected as a component in overall forest discourses. It is amazing that until quite lately in the colonial period, for the Taiwan market, there were still considerable demands for timber imports. For instance, in the earlier years of the Japanese administration, it appeared usually the records as comparable to other major imports like Japanese cotton textiles, timber and sulphate of ammonia. Even after decades of colonial 'development', it was still reported by a British Consul stationed at Tamsui, Formosa that,

The timber imports showed a gain over 1922; so far Formosa was concerned, as there was a big re-export to Japan (Taiwan: Political and Economic Reports, 1922).

The aforesaid discussions demonstrate that the timber supply of Taiwan itself could not satisfy the demand of the Japanese and Formosan residents in the island until the mid 1920s. Therefore, the forestry authority regarded one of the important purposes of the Forest Planning Enterprise commencing in 1925 as the promotion of economic, i.e. commercially viable, lumbering. In terms of timber production, the responsible institution, Bureau of Productive Industry, first of all explained that the firewood is just autarchic, while the production of timber for construction or other purposes is quite insufficient. The deficiency has to be supplemented by importing more than two hundred thousand cubic metres of lumber from Japan or overseas annually. Thus, it would be crucial to produce woods according to potential demands for timbers (Bureau of Productive Industry, 1937a: 2).

The entanglement of different forest discourses contributed to the intended forest and land classifications. According to the forestry authorities, the demarcation and segregation aimed to make good use of the forests to realise reasonable state and public benefits. Different spatial segments with distinct environmental characters in highland Taiwan were

allocated to separate authorities, exercisers, and occupiers. The linkage of use, occupier and classification is worth a more detailed scrutiny.

Forest Demarcation

Through the intervention of forest discourse about the environment and people, the variegated results of forest surveys were defined as some particular types and were demarcated into some specific spatial distributions. The central aim of Japanese policy in highland Taiwan was to rationalise the land utilisation, so the government triggered a variety of actions, such as the development restriction⁴¹, forest reserve establishment, and aboriginal resettlement.

Both colonial officials and engineers believed that dispersed aboriginal tribes and their related hunting and shift-cultivation behaviour caused environmental degradation and thus undermined scientific forestry in the upper valleys as well agricultural production in the lower valleys. Closer settlement which resettled aborigine populations who had scattered in forests and woodlands into concentrated areas, especially lower hills, was therefore seen as a panacea for several colonial problems, including the conservancy of forests and rivers, the supply of industrial concession and so on. Although civil officers and professional foresters disagreed on many policy priorities, they found common cause in forced resettlement.

Reserved-Forest System

In the conceptual framework of forest management, various items of forest and land were merged into three main categories: namely the Reserved Forest (RF, 要存置林野), the Non- Reserved Forest (NF, 不要存置林野), and the Quasi-Reserved Forest (QF, 準要存置林野). **RF** could be regarded as the main body of government forestry, while **NF**, in the form of *Concession*, usually was granted to the Japanese capitalists, the Formosan gentry, and the local governments for agro-forestry development. As the important components in the state forestry, RF actually included the economic timberlands and the forest to be reserved. In addition, **QF** was reserved for specific colonial purposes. In fact, most of these QF items were the ‘Savage Reserves’, while the residuals were kept for the military security and public benefits. Thus, QF could be regarded as an institutional shift from the original aboriginal cultivated patches. In addition, QF was also a temporal or tentative category which meant not only the state could re-claim the land at any occasions, but also the occupants did not hold or possess land.

⁴¹ For example, restrictions on camphor control and management.

Two Forest Planning Enterprises were actually a codification of forest discourse and design. The First Forest Planning Enterprise was chiefly performed in the outer parts of forested districts in the island, as the Figure 4-2 shows. A majority of surveyed areas which were reserved for timber-felling and security uses (coloured in green on the map). The yellow strings of lands, mostly scattered along the valleys, were left for sustaining the aborigines, whilst the red spots were granted to small-scale capitalists for limited industrial development. In addition, **NF** with an extremely large acreage, in the Coast Ranges was an exception to mainstream forest management in Taiwan. They were disposed in a quite different logic and were often granted to specific state-strategy companies.

The Second Forest Planning Enterprise was more multifaceted. The intention of this Second Enterprise was indicated clearly as the classification of forest and land into three types, namely the *Forest reserve* (保安林), the *Lumbering forest* (供用林), and the ‘*Savage Reserve*’ (蕃人所要地) in 1930 (Bureau of Productive Industries, 1931: 61-63). In addition, the forestry authority emphasised the significance of the Second Forest Planning Enterprise for the forest management of this island by drawing upon the existing forest rhetoric in the following words:

The stock of economic tree species around this district of the island would not be considered scarce. Thus, as the extension areas of the Arisan, Taiheisan, Hassensan which constitute the most important logging camps, they would bring great influence to the establishment of sustainable plans....

(Bureau of Productive Industries, 1931: 61-62)

Separate land types were defined and demarcated according to the concept of sensible land utilisation. In this meaning, the forest discourses aforesaid helped to frame the existing factors of land and people as well as to construct the new elements. The authority not only specified the potential areas for exploiting the valuable coniferous woods, but also constituted a range of reserves for soil-water conservancy and aboriginal living. On the one hand, in the origins of main streams and rivers, the government established the Forest Reserves to protect the land and forest from the ‘savage squatting’. In some cases, the founding aboriginal tribes would even be transferred to new homes provided in comparatively low-lying and accessible country. For example, there were many savage cultivated patches in the middle *Takokan* (大嵙崁溪) Valley in the mid 1920s, but the aboriginal population was resettled in another catchment, the *Giran Dakusui* (宜蘭濁水溪) Valley (Ito, 1923: 41). The reason was that the headwater of *Takokan* River which flowed

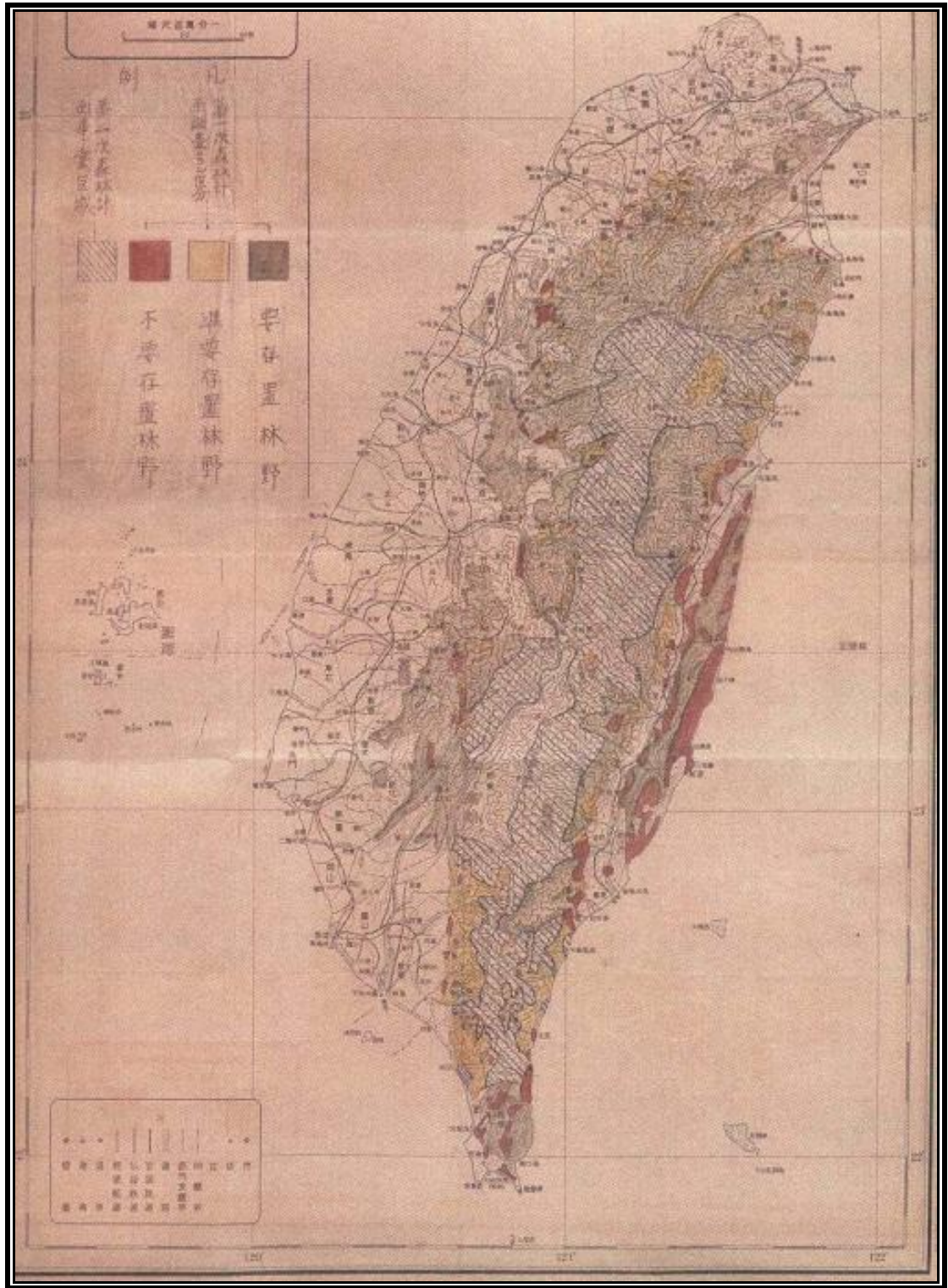


Figure 4-2 Distribution of RF, NF, QF in Highland Taiwan

Source: FGA/ V10363 A1

Note: the central part of the 'Savage Territory' was not yet demarcated before the end of Japanese rule.

through important townships and agricultural districts had been reserved for the purpose of flood prevention under the doctrine of conservancy, but the *Dakusui* River had not.

On the other hand, the 'Savage Reserves' which weighed most in the category of **Quasi-Reserved Forest** were designed for sustaining the aboriginal races. The great

majority of the aborigines were encouraged to engage in rice cultivation, although other complementary subsistence activities were facilitated too. Accordingly, most of the 'Savage Reserves' were demarcated and composed of the lands which are suitable for sustaining paddy fields for as long as possible. These cultivable lands in the hills and mountains are topographically river terraces, soil ledges, and alluvial fans. For example, Plate 4-3 shows the spatial distribution of irrigation canal, paddy field, and settlement site in *Da-nan-o* (大南澳) aboriginal colony, east Taiwan. The people made life by cultivating paddy which supported by irrigation system. Established in 1933, this system of canals drained 123 *Ko* of wet paddy. The settlement was at the foot of hills.



Plate 4-3 Irrigation Canal in an Aboriginal Colony, Da-nan-o

Source: Taiwan Hydraulics, 1933, 5(1), frontispiece.

However, there are not necessarily sufficient acreages of land available for paddy patches. Therefore, the authorities also began to import elements of sedentary agriculture helped the aborigines to earn money by promoting cash crops, stock husbandry, and sericulture. In brief, the purpose of the government was to settle the aboriginal population in the assigned territory in various forms of sedentary agriculture, so that they would not encroach on the forest reserves, lumbering forests and elsewhere. However, not all of the aboriginal population resided exactly in the 'Savage Reserves' which were proposed by government authorities, thus some tribal peoples had to be removed from their ancestral homelands to be resettled in lands now demarcated as suitable to them. The 'Savage Reserve' was thus constituted from aboriginal colony, and its affiliated lands, such as paddy, garden (dry land), and forest.

The argument that the Government preferred the aborigines to conduct the agriculture which had high yield and occupied small acreage could be supported firmly through the attitude toward dry land and wet paddy. The forestry authority in colonial Taiwan showed quite distinct attitudes to the different types of cleared lands which were used for aborigine agriculture. In general, the forest officers did not make positive evaluation of the occupied lands utilised by the aboriginal people. These land patches which dispersed all over the highland Taiwan were usually regarded as misused or unintentional lots for rational forestry arrangement. However, the paddy field did not belong to this list of inappropriate land utilisation. In other words, the existence of paddy field was believed not to harm the conservancy and environmental services. This doctrine was often found in the forest management plans prepared by administrative departments. For example, one of this sort of documents, the Explanatory Statements for *Chikuto* (竹東) FMD demonstrates the principle whether to reserve or to abolish the aborigine-cultivated land.

'Because most of this Forest Management District is located in the Savage Territory, almost all of the un-carefully cultivated lands were cleared by the Savages. The reason why they do so is that the Savages believed that they own the hills and rivers in the Savage Territory. Therefore, they can, with their free will, practice hunting, burning and clearing. In the process of the Demarcation Survey, however, the Reserve for their survival has been determined and subdivided. Most of their originally cultivated patches, due to inappropriate for agricultural farming, were thus disposed to need abolishment or stop going. In addition, the paddy field, partly for its small acreage and partly for its little impact to the conservancy of state land, is approved to be kept untouched.' (Forestry Section, 1932: 119-120)

As a result, in the *Chikuto* FMD, there were 84.92 hectares of dry fields to be eradicated while 40 hectares of wet paddy fields were permitted to continue operation (Forestry Section, 1932: 120-129). This case once again reveals the intention of colonial government for land arrangement in the 'Savage Territory'.

Non-Reserved Forests which were constituted from relatively small concessions were another land category designed for a range of elastic demands. Japanese capitalists and Formosan gentry were granted land concessions, but peasants and smallholders were excluded. These concessions were often not only few in number small in size, but also situated in areas just bordering the 'Savage Territory'. They were also uniformly composed of warm-temperate or broadleaf forests. In other words, the location of Non-reserved forests would not spread and encroach on the occurring places of valued coniferous trees.

That is to say, it complied with the Government's ideology of 'rational land utilisation'. The following *Nai-ko-hei* (內橫屏) case illustrates the practice of forest demarcation.

Partitioning Nai-ko-hei

The partition of the 'Savage Territory' was an entanglement between the public departments and private capitalists, but their own opinions of the aborigines were completely ignored in this process. Among them, the land demarcation or disposal in the 'Savage Territory' of Taiwan was often involved with numerous governmental departments, including especially the forest offices, the police departments and the provincial governments. The network of policy-making mirrored the multiplicity and complexity of land management in this region. At first, the 'Savage Section' (理蕃課) charged with the living affairs of the aboriginal population, such as their subsistence and residency. Secondly, the Forest Section (林務課) (later the Forestry Section 山林課) under the Bureau of Productive Industries entrusted with the oversight of forest and forestry affairs. Thirdly, the provincial governments (地方州廳) attempted unceasingly to make benefits from any potential revenues, as they were required to be responsible for their own finance. The situation was especially obvious after the establishment of budget autonomy system in the 1920s. That marked a period that the Provinces had an obligation to be self-independent financially. One of their measurements to ensure revenue was to establish a system of Provincial Property land (PP, 州有財產) that located at specific areas. Any income from this land would help to balance the local government's budget, such as land lease and afforestation promotion. Unfortunately, the concerns of these government departments did not necessarily coincide with each other. Accordingly, we could argue that the final decisions and actual land arrangement unpacked the true intention and purpose of colonial environmental governmentality. The discussion would follow *Nai-ko-hei* case relating to land disposal and subsequent demarcation in the 'Savage Territory' of *Chikuto* region, north-western Taiwan (Figure 4-3).

The territorialisation process in the *Nai-ko-hen* region was first urged in 1918, but the trial failed ultimately. Initially the authority, the Formosan Government, attempted to open up the region through the cooperation with private enterprise. Established in 1916, the *Taiwan Development & Tea Company* (臺灣拓殖製茶會社, hereafter TDTC) was a multipurpose company which was interested chiefly in tea planting. It was actually a branch of the *Mitsui General Partnership Company* (三井合名會社), one of the tea leaf suppliers in metropolitan Japan. TDTC made a successful application for holding an estate at the *Nai-ko-hei* hills in early 1918. The total land covering the height between 400 and

1000 metres is approximately 7190 English acres⁴².

A meeting aiming to determine the fate of the land was held in July of 1918. Several high-rank officials participated in this conference and many decisions in principle were made. Due to the complex of developing programme, all related senior administrators appeared, including the Civil Governor, Director of the Bureau of Productive Industries, Director of the Police Bureau, Director of the Chief of Forest Officers, and the Chief

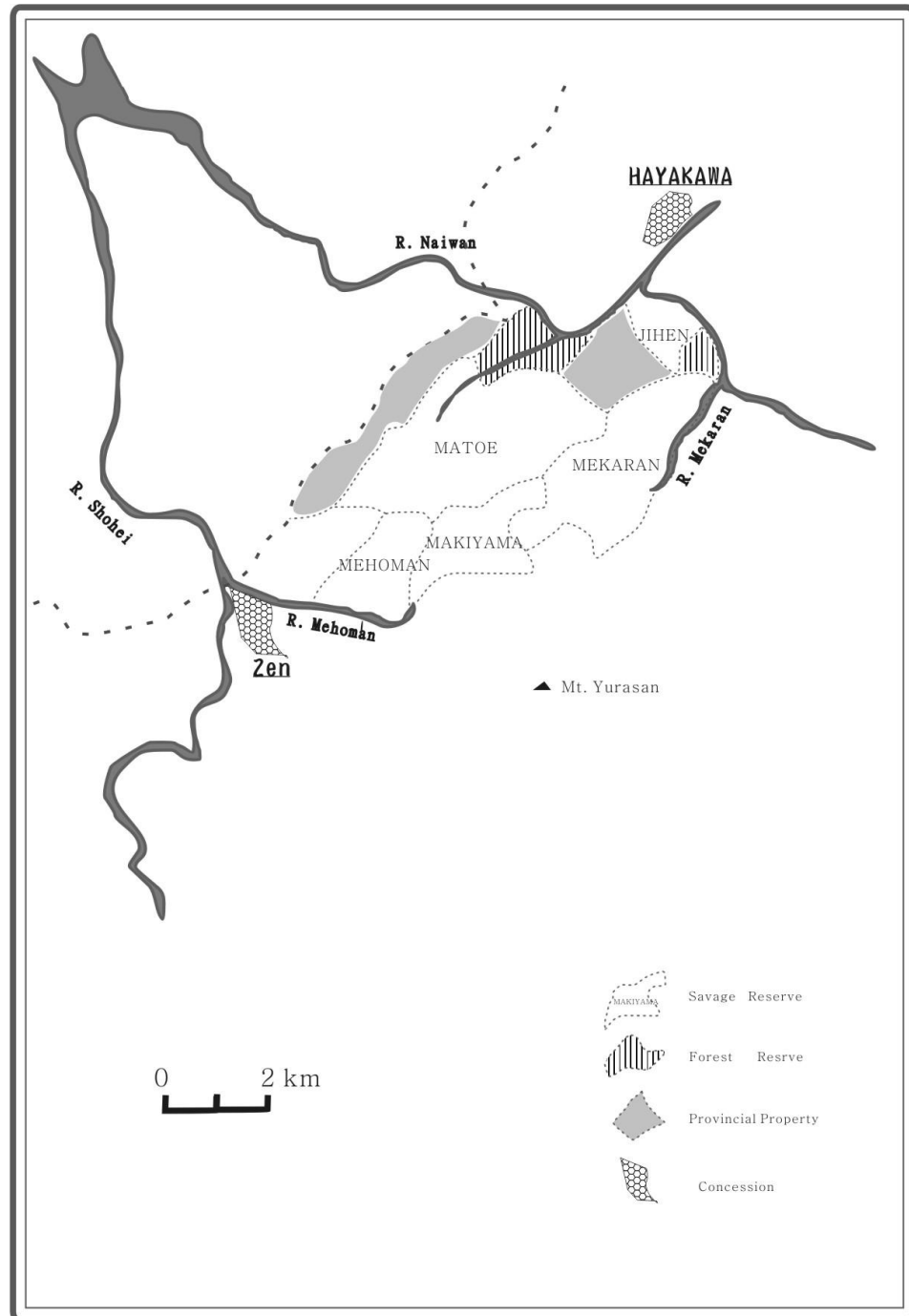


Figure 4-3 Partition in *Nai-ko-hei*

source: FGA V4170/A2, FGA V10352/A1

⁴² Originally 3000 *ko* (甲) in Japanese measurement. 1 Hectare = 2.47105 Acres

Forest Settlement Officer (林野整理課). Although the TDTC was granted a spacious concession, the company was required to assist the aborigine strategy of colonial government in turn. Among the determined provisions, two are especially important for land demarcation. Firstly, the company had to pay expenses for the relocation of aboriginal people and then was rewarded with their fallow land. This company was therefore permitted to establish a tea plantation which the entrepreneur expected in the *Nai-ko-hei* area. The estate employed the *Han* Chinese peasants from neighbouring normal districts rather than the native aborigines to plant and care tea trees. Secondly, the Government asked the company to choose lands for paddy fields and then to allocate lands to aborigines. This programme, including land allocation and paddy-cultivation instruction, was required to complete in two years. As a result, most of the native tribesmen were moved to the flats along the lower *Mekaran* Valley, while the lands which were originally occupied by the aborigines were almost transferred to the TDTC.

The unsettled or disturbed state of affairs in the neighbouring districts led to the co-operation between the private firm and public sectors. In 1919, for example, the TDTC requested the police authority to move the barbwire southward aiming to enclose the tribes of *Mekaran*, *Matoe*, and *Tentana*. By doing to, the tribesmen were expected to have more opportunity to acquaint with the techniques for paddy cultivation. However, the TDTC finally donated ten thousand Japanese dollars to complete the work (Police Bureau, 1932: 511-512).

The *Nai-ko-hei* programme ended as a failure, due to the TDTC's unsatisfactory performance and the further progress of official forest management. On the one hand, the TDTC did not allot sufficient lands for native aborigine's subsistence as promised. On the other hand, the island-wide Forest Planning Enterprise had been in process since 1926 and therefore the Taiwan Development & Tea Company was forced to abandon its concession in February 1928 without exception.

The late 1920s and early 1930s witnessed the formative territorialisation in the *Nai-ko-hei* area. Land subdivisions there became spatial units with definite boundary and it is possible to site this territory on the map. The process was completed through the Demarcation Survey (區分調査) and the resettlement of aborigines.

The Demarcation Survey in the *Chikuto* region was conducted from August to December in 1928. Technician Kuzaemon Yagi (八木 久左衛門) who was affiliated with the Forestry Section was entrusted with the survey aiming chiefly to locate Reserved Forests. Any forest would be kept as the Reserved Forest when it is necessary for the conservancy of environment. This applied to the land abolished by aborigines and the

dry-field had been cultivated by them. Nevertheless, they were not allowed to occupy both of the lands above. In other words, this survey suggested the potential Reserved Forest but did not specify the reserve for aborigines.

The ‘Savage Reserve’ was formed gradually after the relocation of aborigines. Selected localities were refilled with the *Native Aborigine* (現住蕃) populations as well as ones from other regions, namely *Immigrant Aborigines* (移住蕃). Until 1932, there had been five ‘Savage Reserves’ in *Nai-ko-hei* region, inclusive of *Jihen*, *Matoe*, *Mekaran*, *Mehoman*, and *Makiyama* (Figure 4-3) . For example, the *Mehoman* covering an estimated area of 1954.6 acres of land was demarcated as ‘Savage Reserve’ or QF in the winter of 1928. (Report on Quasi-Reserved Forest Survey for the Chikuto District, the Shinchiku Province (新竹州竹東郡準要存置林野調書). Nevertheless, the old concession was released and demarcated for several purposes, such as provincial property lands, the ‘Savage Reserve’, the planed pasture, and the protection forest.

In terms of private concession, Ya-Shih Zen(鄭雅詩), a member of the powerful families based in *Shinchiku* (新竹) City, provides a local gentry case for the concession allocation. In 1926, Zen made an application for permission to own and develop a parcel of land at *Takonan* (タコナン). Zen’s concession located at not far southeast from *Shinchiku* City, in the ‘Savage Territory’. This concession was granted successfully according to the government policy for facilitating the ‘Savage Territory’ development and national lands utilisation, although this land had been originally reserved for government reforestation (FGA/V10352A1).

The advantage of land concessions was not only to curry favour with the Formosan gentry but also to promote industrial advancement to some extent. On the one hand, the neighbourhood of the *Takonan* concession had been known as the naturally rice-paper growing district for a long time. The fact that Ya-Shih Zen was given the land meant that the *Taiwan Rice-paper Manufacture and Colonisation Company* (臺灣蘆草拓殖株式會社) in which he was then one of directors secured the place for producing raw material for craft papers. On the other hand, as well as providing a local source instead of imports the government was keen to promote industrial development in towns and countries. The small-scale and town-based workshop which employed up to forty labourers was able to operate, while the agricultural land in the ‘Savage Territory’ was cultivated for producing economic crops.

CONCLUSION

By lawful means, the ‘Savage Territory’ was shaped as *state-owned land* and then was governed in the hands of various government departments. The spatial governance was enabled by combining the control of aboriginal people with the surveying of their occupied lands. With the end of armed resistance by Formosan Chinese in lowland countries, complete control of the lowlands was secured by the Japanese government and thus the colonial authorities could turn their attention to the suppression of the aboriginal population who dwelled in the Mountain Ranges covered by un-commercialised forests. Either accompanied or followed the subjugation of aboriginal tribes, the police authorities and industrial departments had conducted varieties of investigations since the mid-1900, such as topographical, forest, mineral, and aboriginal affairs surveys. These conducts which were made in the ‘Savage Territory’ constituted the basis of environmental conceptions for this area.

The Japanese administrative interests and preference in terms of industrial strategy relating to mountainous regions laid chiefly on forestry development. Accordingly, a considerable expense was invested in the forest offices rather than mining departments. All measures enabled the strengthening of staff employment and the promotion of forest surveying, although both of forest investigations and mineral surveys were conducted even equally during the pacification. A series of institutional and systematical overland forest surveys were practiced. As one sub-product of survey works, the surveyors documented the literal descriptions and pictorial images of most typical highland landscape: timberland, forest to be reserved, and savage cultivated patches.

Some discourses about the forests in highland Taiwan had been developed increasingly on the basis of surveyors’ observations and the purposes of the Government. These separate but interlocked discourses, such as the ‘*savage squatting*’, the *conservancy of forest and river*, and the *economic lumbering*, were integrated and galvanised the formation of the forest knowledge and subsequent forest division. In this light, the existed elements were re-defined, re-framed, and relocated, while the newly constructed components were incorporated into this collectively constituted forest landscape that date.

The mosaic comprising RF, QF and NF reflected the will of the Government seeing and governing highland Taiwan. The land arrangement formed a relatively stable regime of management based on the distribution of land resource between the state, enterprises, and aborigines, and on a vision of colonial environmental planning in which making conservancy was understood as a complementary means by which to create economic benefits. Artificially and somewhat arbitrarily conceived territorialised units, although

ignoring the aboriginal inherent boundary, signified the importance of forestry development. The Japanese desire to construct the highland Taiwan, namely the 'Savage Territory', as 'Land for Forestry' was apparent. The highland was subdivided into dozens of FMD. For distinct governing purposes, a series of continuous land masses in FMD were separated into more than one part. On the surface, each government department had the right to claim a scale of land as he wished. Practically, however, the Forest offices usually dominated the allocation of lands in FMD.

The colonial authority's initial and final purpose was to settle the migrating people down in selected areas, as if they were planted in the earth. By doing so, the aboriginal hunters, the poor squatters, and enthusiastic capitalists were directed to the quite spatially-restricted districts neighbouring the plain countries. And then the perfect forestry management could be secured in other parts of the FMD.

In a smaller scale, the highland Taiwan demarcation was largely fan-shaped by the very nature of the topography of the hilly country itself and its relation to surrounding land lots. Some potentially-irrigated areas were undoubtedly left for future cultivation of wet paddy. Some lands were proposed for government lease to feed the poor peasants living in the neighbouring normal administrative districts.

Chapter 5 British Surveying in Malaya

INTRODUCTION

The interests of the colonial British governments in the Malay States were clearly or obscurely projected in their early surveying and subsequent mapping activities. Several survey pioneers, for instance, recorded and depicted the navigability of rivers and streams through literal or cartographical documentations. Among them, the ‘rapid’ in the rivers, written as *Jeram* in Malay, even became one of legends on map. The aim of this chapter is to approach the formation of British colonial environmental knowledge on its tropical Malaya possessions. Through the examination of the British cartography in Malaya conducted in the early years of the colonial administration, this chapter attempts to investigate the entanglements between the government, science, and environment. The thesis suggests that through the means of science, the colonial authority not only formatted knowledge about the environment but also facilitated its governance. The exploratory and surveying activities practices of the colonial government first employed the semi-official organisation, namely the Straits Branch of the Royal Asiatic Society, and then used its own survey offices to apprehend the new tropical Malayan land.

To demonstrate the processes involved and their implications, this chapter will be divided into three main parts. First, the chapter outlines the processes of surveying, its attendant ideology and actions. It also examines the personnel and nature of exploration by individuals and teams. Second, it investigates the role of the Straits Branch of the Royal Asiatic Society played in recognising and representing colonial Malayan environments. The final section pays detailed attention to the work of the Survey offices, with special reference to the preparation of the Revenue Survey Sheets and Maps. These cartographical materials were crucial to the land administration, including the agricultural estates and smallholdings, the mining lots, and the diverse reservations. The achievements which were made through specific official networks and semi-official organisations helped together to form the whole knowledge about the Malaya environment.

A number of Foucauldian notions help to locate the processes this chapter reveals. At first, this chapter suggests that the rationalisation processes proposed by Michel Foucault could apply to the exploratory activities promoted or triggered by colonial government. The aim of the authority is to govern the new land, through developing some specific survey tools, methods and even institutions. The chapter uses Foucault’s term ‘genealogy’ to indicate its intention to investigate the origin of environmental knowledge, tracing the experiences and ideas leading to the commencement of land classifications, arrangements

and management in British Malaya. Borrowing Foucault's deployment of 'rationality' as a will to control, with special reference to classifying or ordering, it is possible to understand colonial land surveying or exploration as being undertaken under the authority's will to govern or improve its possessions. Although in a different context, he provides one example of physics to demonstrate his thesis on the effects of the travels of the rationality of natural science. Foucault states that 'since it had proved possible, by means of experimentation and theory, to analyse the laws of movement or those governing the reflection of light beams, was it not normal to seek, by means of experiments, observations, or calculations, the laws that might govern the more complex but adjacent realm of living beings' (Foucault, 2002: 125).

Environmental knowledge, like any other comprehension of the fresh possessions of empires, both facilitated and completed the colonial enterprises of powers. In the forms of boundary delimitation, resource surveys and engineering preparations, the operations of different goals spread across Malaya here and there following the British intervention. The chapter shows that the way by which the environmental knowledge framed by the explorations of different forms lead to formations of land demarcation system in response to colonial needs and strategies. On the one hand, the environmental knowledge discussed here will focus its attention on the officers' perspective, as it is their perceptions derived from the lands that actually directed the demarcation and further management of colonial territory. The version of the Malay environment used by the colonial state originated from the data collecting and processing by civil actors. This process, especially the collecting stage of information could be done by the personal observation and documentation in the field as well as the careful reading of predecessor's records. On the other hand, as indicated by Foucault's work of governmentality as well as scientific ordering, the exploration or surveying is by no means innocent, but intertwined with the will of colonial authority.

EARLY CONTACTS AND DEVELOPMENTS

Malaya only really became the focus of the Straits administrators and merchants in the latter half of nineteenth century. The Straits Settlements which were founded by British government in 1826 had served as the trading base and commercial depot within the area surrounded by Borneo, Sumatra and numerous smaller islands. That the most prominent were the islands of Penang and Singapore, focused towards passing sea routes rather than the mainland and occupying the two entrance terminals of the Straits is telling about early colonial orientations and priorities. Penang, the northern settlement of the Strait of Malacca, had emerged as a naval base by the British East India Company since the last quarter of

eighteenth century, but prospered by its trade particularly with Sumatra. Penang, a part of the Bengal Presidency, therefore became very much a desiderata on India. It was incorporated into the newly created '*Straits Settlements*' under the British Indian Government in 1867. At the southern end of the Strait, on the other hand, Singapore flourished as an *entrepôt* and especially as a centre from which commodities could be supplied from the Archipelago for the China trade (Cowan, 1950). However, the Straits Settlements were increasingly challenged as western shipping hubs, with this in traffic after the opening of the Suez Canal in late 1869 and the establishment of more commercial posts in its vicinity, such as Indo-China by the French, Sulu Archipelago of the southern Philippines by the Spanish and Labuan of Borneo by the British themselves. The Straits Settlements were increasingly forced to be aware of and respond to the aggressive activities and competition from the outposts of European counterparts in Southeast Asia.

The residents and officers thus turned their attention to another zone of interest, the peninsular portion of the Malay world that formed their potential hinterland, for the supply of agricultural products and producing tin ore for export. The vision for the Straits Settlements became wider than trading and staging posts. These Malay territories not only appeared in the British administrative eyes as offering new resources to support the settlements but also attracted increasing private and commercial interest. On the west coast of the peninsula, a series of riverine states which are ruled by the Malay chiefs of *Sultan* and *Dato*, ranged from *Larut* and *Perak* in the north, through *Selangor* and *Klang* in the middle, to *Sungei Ujong*, *Rambau* and *Muar* at southern edge. While it is situated in the heart of peninsula, *Pahang* occupied large acreages of hills and mountains as well as providing the overland gateway to the South China Sea. To say it differently, the west coast of Malay Peninsula had much more accessibility than its east counterpart to the main exchange route, the Strait of Malacca. Accordingly, this area, namely the *Protected Malay States* since 1874 or the *Federated Malay States* since 1896, was ever of interest for the British. It was thus a chief cluster of the British colonial practices and will be the centre of my discussions focus too. The other Malay states accepted little British involvement and were usually termed as the *Unfederated Malay States*, such as Johore, Trengganu, Kelantan, and Kedah.

Economic-geographic concern promoted the British intervention into the so-called *Native Malay States*. And yet, if the British were sure of the commercial imperative, the exact nature of the economic possibilities and resources was remarkably unclear at first. For example, what agricultural produce, mineral wealth and other natural resources were expected to be exploited? Where would be the production districts of the above said

resources and could their expected or potential areas be extended? How many navigable streams, fertile valleys and prosperous harbours were there? And were there any additional transport routes possible? In brief, what are the geographies which are consisted of physical and human features that underpin the Malay Peninsula? Here we have an economic geographic perspective where the geographic becomes economic in potential – and is realisable only to the extent it can be known and catalogued. The initial reconnaissance on behalf of and impressions of the British governments and populace about the Malay Peninsula, and how would they respond to the new terra incognita are the main concerns in this chapter.

However, it is astonishing how little knowledge the British initially have of the neighbouring Malay States situated at its immediate vicinity of crown colony. The severe deficiency of environmental knowledge before the British intervention in the mid 1870s, could be indicated on the one outline map which was produced to assist the accounts of Frank Athelstane Swettenham who may be called one of the few officers with plentiful official visits at those dates (Figure 5-1). Note that at least two points feature on this Swettenham map of the mid-1870s. On the one hand, the known places and polities, whether larger or smaller their sizes, were marked in his pictorial illustration. Much more detailed information and instructions on the coastal west states than the states which were situated in east coast reflected the British focus on trade routes through the constricted straits rather than the Western littoral of the South China Sea into the Gulf of Thailand and its developing interest in the former districts. Where there is detail on the peninsula it is structured around access from the sea through the riverine system. On the other hand, no political boundaries between the separate but adjacent state units were definitely specified. The question of the British unfamiliarity with the Malay States' boundaries may be answered by Swettenham's statements as follows. On the basis of his personal experiences, Swettenham expressed with confidence that:

'Countries where such cases as these were too common to afford remark for more than a day, were not likely to offer much inducement to foreigners to invest their capital, or trust their lives in; and Selangor, except in Klang and Lukut, is almost an unknown country'.

The description makes the point that cognisance is thus here pictured as a prelude to securing industrial investment. That is 'knowledge' implied trust and thus returns to investment. According to Frank A. Swettenham's argument, a permanent nature of land ownership was to be desired in order to attract foreigners to take up land and to invest in its improvement and development (Swettenham, 1874). Some of the crucial inspection journeys made by Swettenham from 1874 to 1876 will be examined further in the later

sections of this chapter.

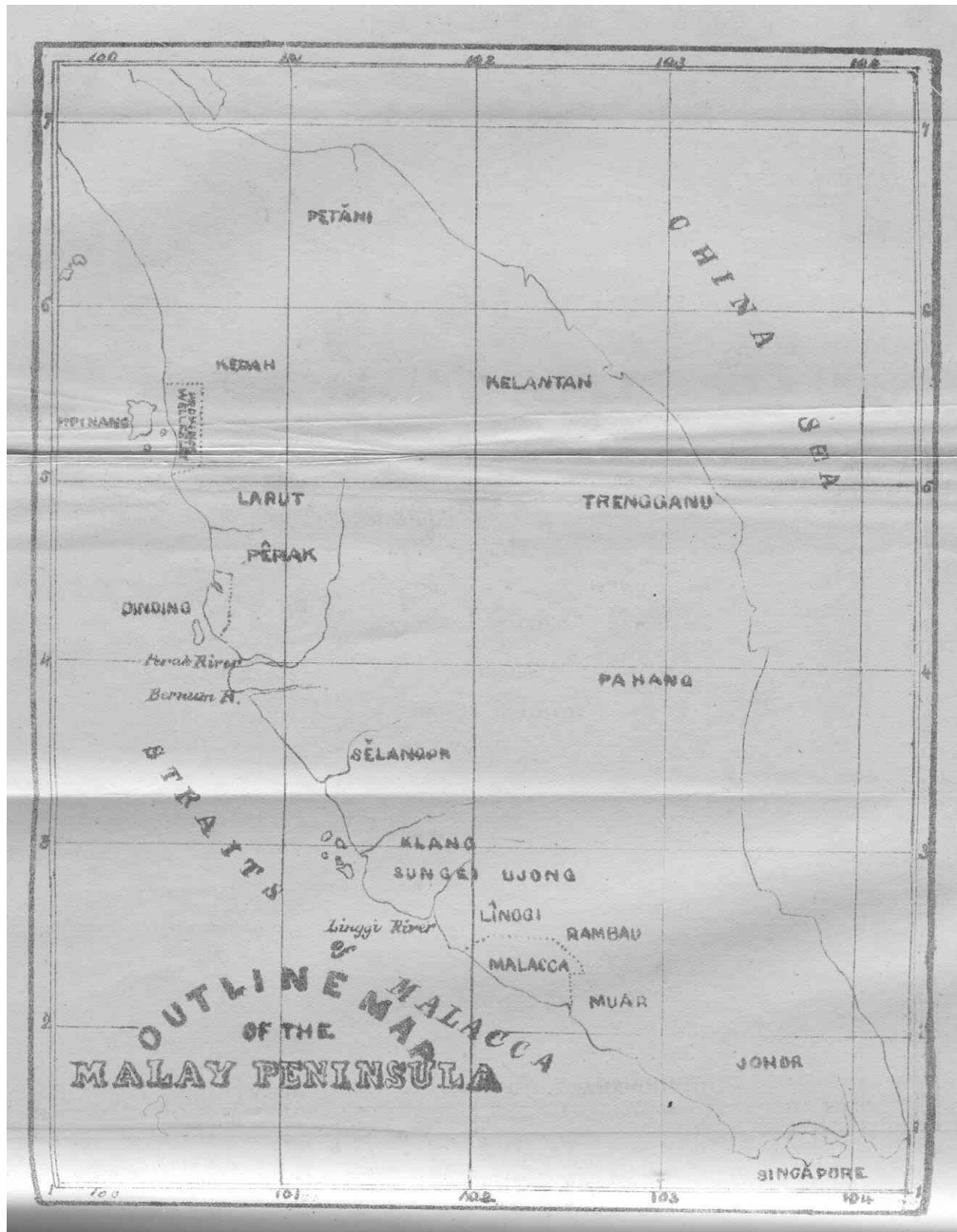


Figure 5-1 Outline Map of the Malay Peninsula, c.a.1875

Source: Swettenham, 1881 Journal of the Straits Branch of the Royal Asiatic Society

The formation of colonial environmental knowledge reveals the entanglements between the government, science, and environment. A genealogical approach will be used to investigate the process of environmental knowledge formation on the basis of the British case in colonial Malaya, mainly focusing on the initial intervention period following the 1870s. In practice, the following section attempts to approach the rise of British governmentality on Malay Peninsula, with special reference to tracing the primary map compilation activities of different stages and themes.

Prior to this period, no considerable objects and results were achieved by scattered

exploratory activities, owing to the lack of organised societies or government departments coordinating them. Thus the early British officers in colonial Malaya felt dissatisfied with the deficiency of their knowledge about the population and territory in Native Malay States of Peninsula. Some sporadic but pioneering expeditions, explorations, and inspections were triggered by some specific colonial officials, especially after the 1870s. After a short time, the Straits Branch of the Royal Asiatic Society was formed in 1877 and had become one of the most influential and semi-official forums in the neighbourhood of South East Asia. Although the Society was based in Straits Settlements, the centre of the British power in the Malay world, it had broad concerns and expressed high interests for colonial knowledge exchange and circulation in both the Crown colony and the adjacent Malay States.

The general situation appeared not to change until more organised public departments and professional offices were established gradually in Malaya between the 1880s and 1890s. Of them, the staff of survey offices played a critical role in making geographical knowledge or environmental ideas about British Malaya and therefore laid the foundation for the management and administration of land-related affairs. In practice, the sedulous surveyors and trained demarcators not only assisted other government organs to measure and assess the lands but also produced a number of rough tracings and more detailed maps to coincide with administrative purposes. Even though nearly all of the survey offices in the Protected Malay States had their origins in different systems and executed the surveys with separate modes, they were finally restructured into two types of units, the Trigonometrical Department and the Revenue Survey Departments. After the segregation of duties, the former department specially took charge of the preliminary trigonometrical survey work, while the latter offices were responsible for the cadastral survey and the ensuing affairs. In addition, to effect the governance of each State in the British possessions of peninsula, the last decade of the nineteenth century and the first quarter of the twentieth century were thus experiencing the centralisation of administrative institutes, namely the federalisation of colonial systems to some extent.

DEFICIENCY OF KNOWLEDGE

The outlining examination of surveying activities, including the background of the tasks, the personnel of teams and individuals, and the effects of these itineraries, become the purposes of this section. The upcoming section is not intended to reconstruct the complete history of environmental knowledge formation by specific figures, rather than to portray a symptomatic picture about knowledge of Malayan land as a whole. Accordingly, it will

also address the representations and circulations of the exploration-based environmental knowledge in later sections of the chapter.

As many as possible available materials which are derived from the official archives, organisation publications and private travelogues have been collected in this study. Among these, the State Government Gazette (simplified as *Government Gazette*) is one of the most useful of all official publications. It not only contains information on a wide variety of issues and subjects, but also releases departmental and administrative annual reports. (Burns, 1965: 27) What matters were important to individual states would be stated within the current issue. Usually, the explorations reflected the colonial priorities of separate empires in their dependencies. According to current interpretations, Malaya had experienced at least three distinct stages of surveys during the British administration: the Indian Government and early Straits Settlements administration before 1870s, the British Intervention period and Institutional Surveys.

Administration of Indian Government and Straits Settlements before 1870s

Malay Peninsula was paid little attention since it was put into the sphere of the British power. Almost all of their exploratory operations were triggered no earlier than 1874, as the year which marked the commencement of the formal British intervention in Malay States' affairs. Up till that point, attention to the geographies and cartographies of the Malay States and their adjacent areas had been centered on the real British possessions, that is, the Straits Settlements.

The effort of James Richardson Logan, on the one hand, should not be ignored, when considering the environmental knowledge pertaining to the Malayan world. The advancement of geographical knowledge was contributed initially and mostly by Logan during the years 1846-1853. Although he is one of the most significant and pioneering figures, the details of James Richardson Logan's early life are unfortunately not known. He was trained in law, but after migrating to the then Straits Settlements between 1830 and 1840, settled in Penang and forged a notable career in journalism and public life. Logan's reports and papers were primarily published in the *Journal of Indian Archipelago* and its successor the *Journal of the Indian Archipelago and Eastern Asia*, both of which were edited by him. The concerns of Logan, however, did not stretch too far beyond the Straits Settlements, as the review in Allan Maclean Skinner's classic contribution '*Geography of the Malay Peninsula*' shows (Skinner, 1878). Skinner was not satisfied with the geographical findings and concluded that 'Those papers contain a fund of minute topographical details, the itineraries of at least six important journeys in the interior, and, in

short, much of the rough material for a Map of the districts which lie nearest to our Settlement' (Skinner, 1878: 52), but they had not been synthesised to form that body of knowledge on areas beyond.

For most of the enthusiastic officials and professionals, on the other hand, they were clearly aware of and discouraged by the slow cartographical progress which the Indian Government and the Straits Government had achieved before 1870s. For example, Sir Andrew Clarke recalled the difficulties of collecting *Malaya* maps, at an Evening Meeting of the Royal Geographical Society, held on the eighth of May 1882 nearly one decade after resigning from his Governorship in the Straits Settlements. Before he stepped into the service formally, Sir Andrew reminisced that he had enquired if there were any sort of maps or any information regarding the Straits Settlements from the Royal Geographical Society at London and was told that 'there was absolutely no such information' by the Curator at that time. Upon arriving at the seat of his government situated in Singapore in 1873, he received almost the same response from local offices about information in regard to places other than the settlements, namely the Crown colonies themselves (Daly, 1882: 410).

Even the establishment of the survey office was not specifically for taking charge of the surveying affairs. The lack of knowledge about the nature and extent of territories demonstrates the indifference of the Indian Government over one of its smallest and remotest administrative possessions. The Singapore Survey Department could trace its origin to 1826 when it was under the administration of the Assistant Engineer of the British Army Garrison who was the Surveyor and Registrar of Titles. It was regular officers of the local Garrison who actually conducted Land Survey work until 1847. For the next twenty years, the supervisory control was passed to the Surveyor-General of Bengal (Survey of India). In 1879, the department was incorporated with the Public Works Department and was under the direction of the Colonial Engineer, assuming the office as Surveyor-General.

Although Clarke was quite aware of the significance of surveying, the only available map he was able to consult at that time was an old and cursory map released in 1862. It might be his experience of government careers in the Royal Engineers in England as well as the Survey-General of Victoria, Australia that reminded Clarke of the necessity and emergence of surveying in Malaya. One sketch map, *The Malayan Peninsula* (Figure 5-2) from a compilation by T. Momot, Surveyor-General of the Straits Settlements, was first produced in 1862 and obviously served the political needs of the Indian Government. It is also revealing of the contemporary geographical knowledge about Malaya at that time. Any careful reader inevitably has their attention drawn to the coloured blocks which

emphasised the polities of different rulers and their particular relation with the British and Siam governments. However, the boundaries between separate political divisions are largely illustrative at best and imaginary at worst, and along with the obscure and unclear names of hills, rivers and places, mean that none of the information is useful as the basis for local administration. In other words, this type of map was more a diagram of geopolitics than a tool for actual colonial rule.

Early British intervention period represented by Sir Andrew Clarke

The British intervention in Malaya in the 1870s, while Sir Andrew Clarke occupied the director's status, commenced consciously and dramatically the environmental discourse on this alien and little known land. One of Sir Andrew Clarke's contributions for mode of British governmentality on Malay Peninsula is to inaugurate the man-land survey and map compilation endeavours that had made the new territory visible. And because the administered districts are identifiable, it is possible to govern them. Much attention has been paid to the influential negotiation Clarke made in the Pangor Treaty (January, 1874), and yet the exploration parties' work shortly after the event has been shrouded in ignorance. As one of the pioneers in formatting the geographical knowledge on Malay States, however, A. M. Skinner had noticed the importance of Sir A. Clarke's initiative and the developments in native territories of Selangor, Perak and Larut since the late 1860s (Skinner, 1878). The role and contribution of Skinner on knowledge formation will be furthered in the next section, which deals with mainly the circulation of environmental ideas within the semi-official network of Straits branch of Royal Society, of this chapter.

It is the map 'Malay Peninsula of 1875' that shows the very outline of Malay Peninsula in the mid-1870s that framed the British conceptions of Malayan environmental knowledge firstly (Figure 5-3). And this map also shows knowledge expanding gradually around the colonial settlements. Whist it is undoubtedly Sir Andrew Clarke who led the opening of the Malaya to the public through cartography, he failed to witness the fruition of his ideas in that map which was published in the October of 1875, some five months after he left the seat of Straits Settlement Governor.



Figure 5- 2 The Malay Peninsula 1862 (Surveyor-General of India)
 Source: CO273/74C-No.7362

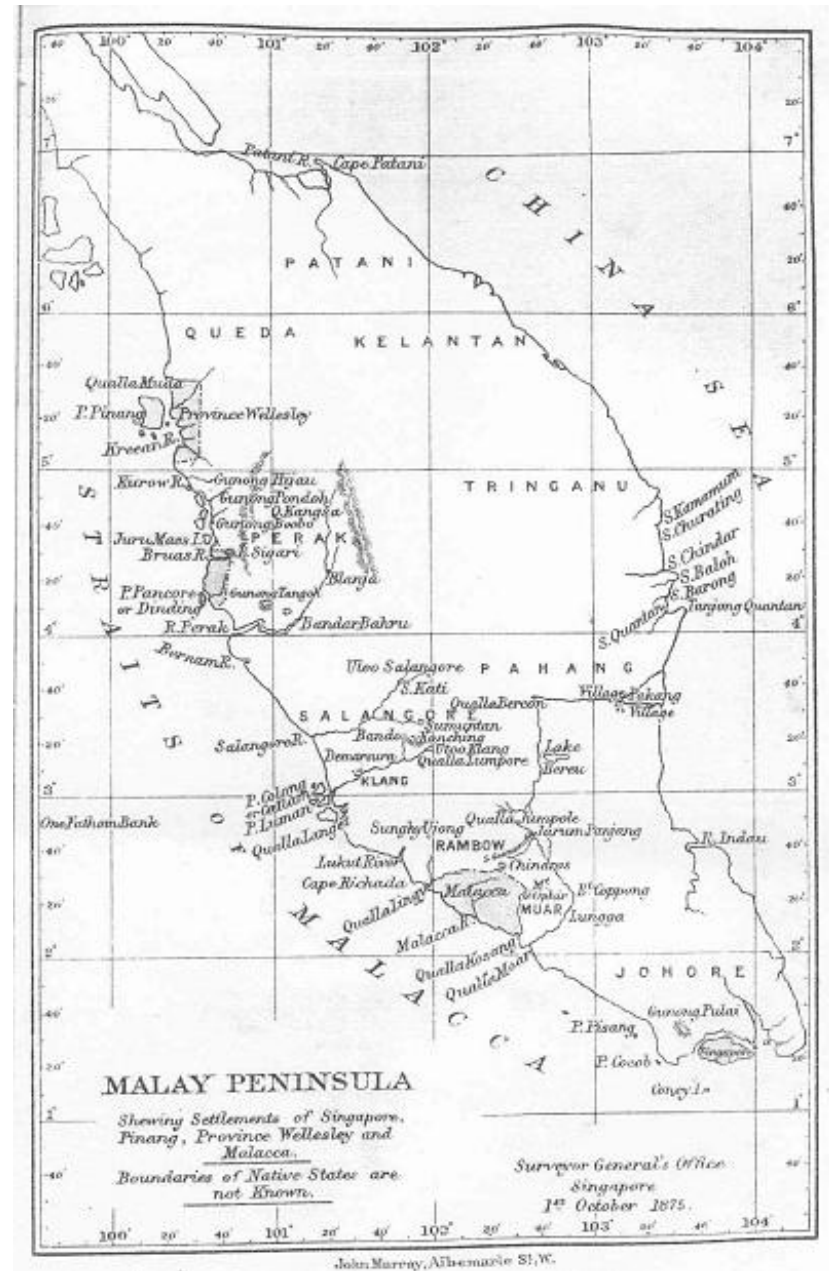


Figure 5-3 Malay Peninsula of 1875 (Surveyor General's Office, Singapore)
 Source: Col. R. H. Vetch C.B. ed.1905, *Life of Sir Andrew Clarke*, face page.

Several surveys which are instigated by Governor Clarke or undertaken by domestic officers will be investigated in the later passages, but the focuses will be on the motive and results rather than information recording and representing. The main analysis will be of the following three sets of itineraries. The districts from Larut to Perak in the north were surveyed by Messrs Dunlop, Swettenham and Pickering in 1874. The common source of River Muar and River Pahang was explored by Messrs. O'Brien and Daly. The journey into the interior of the Peninsula was performed by Mikluho de Maclay in 1875. How these explorations had filled the obscure blanks existed on the map of Malaya is going to be examined in detail here.

The territorial manifesto served undoubtedly as one of the important elements, although these itineraries varied themselves in their purposes. In other words, the surveying and mapping of authorised areas ensure the actual appearance of the British governmentality. For instance, one of the aims of the expedition which Daly performed in summer of 1875 is an attempt to clarify and delimit the boundary between and beyond Nine States or *Negri Sembilan*. In July of 1875, the Governor, Sir W. F. D. Jervois, deputed Daly to explore the Muar (or Moar) River and the relationships in the interior of the unexplored states. Although he was equipped with surveying instruments, accompanied by a party of Malays and afforded assistance from principal Malay rajahs, Daly, unfortunately, failed to ascertain their relative positions and internal management within the states, due to the hostility of local Malays. One of the drivers to ascertain the position of their boundaries was that some of them were conterminous with the British territorial boundaries of Malacca.

Not surprisingly, the earliest survey works which were performed in the Malay Peninsula were provided and supported by the Straits Government. More surprisingly, some of surveyors, such as Dominick Daniel Daly and Geo. S. Lefroy, had backgrounds in public careers in the Australian continent. For example, D. D. Daly was a nephew of Sir Dominic Daly, the Governor of South Australia (1862-1868), and Daniel had been sent out to be aide-de-camp to his uncle. Daly was an assistant surveyor on the Northern Territory Surveying Expedition, Australia, in the late 1860s. He married Harriet (the daughter of William Douglas) in the early 1870s, and it is not too long before his departure to the Straits Settlements with his father in law. The exploration undertaken by Dominick Daniel Daly in the state of Selangor in 1875 was completed during his service in Public Works and Survey Department based in Singapore. Daly was deputed to commence a rough topographical survey of this state in May, shortly after his appointment as surveyor for the Native States by Sir Andrew Clarke (Daly, 1882: 393).

In addition to these well-known itineraries, many more official or semi-official but

sporadic inspection tours made contributions to the formation of environmental knowledge on Malaya as well. These tours are typified as detailed descriptions of the officers' travelling routes, such as prominent landmarks and landscapes. For example, Messrs. C. J. Irving and J. Douglas made a trip up the Kesang and Muar Rivers in July, 1877 (*CO 273*). The purposes are to try and see how far a steam-cutter could be taken up the Kesang and Muar rivers and to observe the state of the country on the river banks. In the eyes of these officers, rivers would be evaluated according to their navigability while land frequently could be assessed for its fertility or suitability for any land-based primary industries.

Nonetheless, even though the pioneer explorations met the curiosity of the new territory, further comprehensive surveys for pragmatic needs in administrative affairs were not undertaken until the establishments of formal survey institutions in the Malay States.

COMMENCEMENT OF KNOWLEDGE

The further development and prospering of early British environmental knowledge in the Malay World can be gauged by the foundation of the Straits Branch of the Royal Asiatic Society in 1877. The Straits Branch of the Royal Asiatic Society and its successor served not as a financial patron of surveys but one of most influential forums for the exchange of environmental knowledge. In fact, the Society was organised independently of the government by energetic officers and an enthusiastic populace, but it was partly sponsored by the Straits Settlement Government. Considerable geographical information labelled under miscellaneous notes or occasional notes are to be found in almost every issue of society's journal. The phenomenon reflects perhaps the interests of editor who was often seconded by the Honorary Secretary, but it is mostly related to the needs of colonial government, as the society was granted patronage by that authority. Therefore, this section of the thesis firstly tracks the establishment of environment-related network in public and private sectors. These paragraphs then feature how ideas and information circulated in separate networks. Finally, it examines if there is any exchange or transmission between the above said networks and wonders whether and how the working of networks have effects on colonial governmentality.

Administrator-scholars and the network of the Straits Society

The constitution of colonial knowledge, in general, had two primary sources. The conceptions with regard to environmental information or geographical facts are not any of these exceptions. Some passionate officers and men of independent means interested themselves in the historic materials written in European languages or Malay scripts during

the pre-colonial period, or periods of Portuguese and Dutch rule, while others expressed high interests in conducting investigations in the field by themselves. The latter, namely the surveying mentioned here, played a particular role in the process of knowledge formation, as most of the surviving data or documents generated by prior colonisers, such as the Portuguese, were not necessarily suitable or proved insufficient for the successors.

In Malaya, the British administrator-scholars often refer to the individuals who were both the officials of the Government and the members of the Society. These enthusiastic individuals were always governmental officials themselves. For example, Skinner who was appointed as Resident Councillor of Penang (1887-1897) and then deputed the Colonial Secretary of the Straits Settlements who ever sat the post of President. They were not only elected to important posts, but also presented several reports and articles relating to their public careers.

The Journal of the Straits Branch of the Royal Asiatic Society was published half-yearly by the society in Singapore from 1878. The object with which it was promoted was to collect and print information regarding the Malay Peninsula and neighbouring countries. With the further British intervention in Malay states in early 1920s, the Society and its original interest were succeeded by the Malayan Branch of the Royal Asiatic Society which devoted its first number of the 'Journal of Malayan Branch of the Royal Asiatic Society' in April, 1923 to a variety of methods which were chosen to approach the quite unfamiliar territory that the British appropriated not long ago. However, most of the contributors might be classified as the *administrator-scholars*. Administrator-scholars refer to some individuals who not merely did service for the government but also made research into the affairs of people and land there (Braginsky, 2008; Kratz, 2009). A plentiful number of the Society members were actually just such administrator-scholars who belonged to the constellation of such men, British in particular, in Southeast Asian studies from the late nineteenth to the early twentieth century.

These administrator-scholars or gentlemen-scholars had continued to carry on working on a range of issues in relation to Malaya, whether through archive research or field work. Although they were trained in different specialist disciplines and employed separate methodologies, these individuals could be roughly classified into office-oriented and field-oriented types. These types were represented by William Edward Maxwell and Frank A. Swettenham respectively. Their influences were so apparent in furnishing interesting, treasurable, and practical information about Malaya that this section cannot ignore them. The following section aims to examine the work of the Straits Society, in terms of the attitude toward the pre-colonial knowledge and the exploratory activities practiced by the

British themselves.

Pre-Colonial knowledge

The participants of the Society, in essence, not only adopted some treasured information from the archival materials written by the pre-colonial contributors but also worked on the aforesaid sources to catalyse their own knowledge.

The Society and its members were keen in forming catalogues of works dealing with Malayan history, geography, literature, and so on. Such contributions were released steadily. As early as in 1880, the third year since the first issue of the Society Journal was published, Dr. Nicholas Belfield Dennys sought assistance from the members of Straits Society in providing information to produce this kind of list in a general meeting (Annual Report, 1880). Afterward, Dennys also released his results as an article, entitled *A contribution to Malayan bibliography*, in the fifth issue of the Journal (Dennys, 1880: 69-123).

The founding members of the Straits Society and their followers were not averse to using, amending and evaluating some valuable materials which were produced by other associations or institutions, especially the societies which based in the neighbouring territories outside of the British influence. In the mid-1880s, for example, the Straits Society granted permission to the Batavian Society of Arts and Sciences, Dutch East Indies, to reprint two interesting and important papers, namely the J. R. Logan's work on the Rocks of Pulau Obin and W. P. Groeneveldt's paper on the Malay Archipelago. (Maxwell, 1887: X V)

In addition, the Straits Society made the best efforts to collect and republish two series of texts and essays from several learned societies regionally in 1886 and 1887 too. Although the compilations were titled as 'Miscellaneous papers relating to Indo-China' in 1886 and 'Miscellaneous papers relating to Indo-China and the Indian Archipelago' in 1887, their contents actually comprised matters in the British crown colonies, protectorates, and chartered company as well as the Dutch East India at that date, centred around of course the British influenced dependencies and territories (An Index to Journals Nos.1-50 of the Straits Branch of the Royal Asiatic Society and to Notes and Queries I to IV).

British exploratory activities

Since its foundation, the Society never stopped introducing new geographical knowledge which was collected by a range of energetic explorers to its members. In the 1870s and 1880s, immediately the decades after the British intervention in Malaya, several purpose-based expeditions which though sporadic in the sense of being uncoordinated,

became prevalent in particular sites or areas where the British interests were laid on. William Cameron, a pioneer stepping into the middle of Malay Peninsula, was one of these kind of figures who undertook these expeditions. William Edward Maxwell, the Honorary Secretary of the Society, informed their members of William Cameron's death with regret but did not forget to point out the contribution of Cameron in Annual Report of the Council of the Society for the year 1886. Maxwell said:

while alluding to the subject of Geography, the Council cannot but record the loss which the Society has sustained in the death of Mr. W. Cameron, whose explorations have added so much to our knowledge of the States of Selangor, Pahang, another portions of the Peninsula (Maxwell, 1887: X V - X VI).

By the time that Noone began his reconnaissance into the interior, coastal and lowland riverbank areas had already been investigated and exhumed for mineral and agricultural use by Malays, Chinese, and British. The smaller upstream tributaries, areas away from major riverbanks, and mountainous terrain, however, remained relatively unscrutinised by either lowland pre-colonial or European colonial gaze.

Most of the domestic officers, at all times, had abundant experiences in field inspection or business tours. A number of unexplored and sparsely populated areas were traversed by these low-grade bureaucrats. From the early years of his government career, Swettenham had accompanied governors on their visits to Malay chiefs and had also been sent alone on missions to the states (Heussler, 1981: 89). He was perhaps confident that only by collecting of data in the field, as well as observation and experiment could a programme, adapted to local conditions, be evolved.

In relation to the deficiency and partiality of British knowledge on Malay States in the earliest years of administration, Frank A. Swettenham made probably a proper metaphor in 1880, five years after his journey made along the coastal plains from Perak to Selangor as follows:

So far the Malay Peninsula had been, so to speak, a book which we had been content to see lying unopened within our reach; we saw only the cover, indeed only one side of the cover; the names of the large Malay States were unknown to all but a very few, and their real position and boundaries to none in the Straits Settlements (Swettenham, 1880: 51).

Swettenham was painfully aware that the British subjects merely discovered or produced very limited conceptions for some specific areas until the early 1880s. He went on to exemplify that:

In 1875 we were raising the cover, still only one side, and peeping inside at the first

few pages; now, though we have still little exact information, we have much to add to our former knowledge of the peninsula, and especially as regards the western States. We know, for instance, that the Perak river rises in the borders of Kelantan, Kedah, and perhaps Pahang, and, after running a short distance in an easterly direction turns to the South and continues parallel to the coast-line until within a few miles of its mouth, when it turns West into the Straits of Malacca, about eighty miles South-West of Penang (Swettenham, 1880: 52).

Meanwhile, the final quarter of the nineteenth century witnessed the progress of British intervention in regions which centred in Perak State vicinity as well. The early experiences of the administrators who benefited from their fieldtrips did influence the future of British rule to some extent. At least, it is the case for the fieldwork conducted by Swettenham in the mid-1870s. Peter L. Burns and C. D. Cowan claim that all of Swettenham's writings reveal the importance he attached to his experiences in the mid-1870s important for the Malay States and for himself (Burns and Cowan, 1975: V). These colonial officers were typically interested in several features of a district or region, such as the political state, their social condition, and their agricultural and mineral resources (PGG 1888 Notes (Nov.2nd) C. F. Bozziolo's (Magistrate of Upper Perak) Journal of Upper Perak (Apr-Jul).

Considerable sketch maps were produced to locate the spatial extent of items or landscapes, since the British had been more involved with the Malaya. The government officers made sketch maps to record their location in any administered territory, by placing settlement names, drawing river channels and inscribing mount symbols. The natural historians, such as botanists, geologists and zoologists, demonstrated their observations by presenting distribution maps with their written records. The travellers evidenced their expedition into the unexplored territory by sketching routes of their arrival. The maps indeed provide media for communicating environmental knowledge which was observed and recorded in new territory, even if the sketch maps may be valued more highly or lowly according to their details and instructions. Nonetheless, the reason why these simple but visual sketch maps are popular is that the sort of cartographic documentations provide visible impressions and information.

Frank Athelstane Swettenham, like other explorers or administrators, not only devoted himself to the inspection-based journeys but also was glad to publish his relevant journal or memoir to the public. Numerous exploration journeys had occurred since the mid-1870s. For example, several papers which were contributed by Swettenham could be easily accessed in the opening volumes of the Journal of Straits Branch of Royal Asiatic Society. It is worth noting that Swettenham's papers customarily featured that he accustomed to

attach one or more graphics, drawings or sketch maps. The graphics which are often affixed into his Perak journals 1874-1876 do not occupy the portions of my discussion here, because they are often sketches in essence and show merely the relative position. By contrast, the attached sketch map in a journey across the Malay Peninsula by Swettenham in 1885 when he was Resident to Selangor exemplifies his use of maps (Figure 5-4). Swettenham, in spring of 1885, made a journey with some of his staff, such as Major Walker, Capitan Giles, and Mr. Lister. They initially steamed upstream from Kuala Bernam in the Straits of Malacca, and then walked through Kuala Slim, Kuala Geliting, finally rafted downstream to Kuala Pahang in the South China Sea (Swettenham, 1885: 1-37). This Trans-Peninsula journey which started from the 10th of April and ended on the 14th of May was perhaps the last of Swettenham's several overland journeys. Swettenham made a number of expeditions or inspections in different stages of his official career, such as the early 1874 Commission to Perak with Messrs. Dunlop and Pickering from Larut to Kuala Kangsa, the Selangor and expedition into the interior in 1875, the expedition to Perak, Selangor, Pahang, Trengannu and Kelantan and to Thailand from 17th Apr to 22nd Jul 1875 and so on.

The achievements of most of Swettenham's journeys are to situate the prominent landmarks, such as hills, rivers and plains (as the commission from Larut to Kuala Kangsa described), and crucially for imperial commerce and governance to confirm if the connection between two districts is possible (as the Trans-Peninsula journey did). Sometimes Swettenham cannot help to portray the landscape he witnessed from the perspective of possible industrial development. For example, he stated the following remarks dated 14th April that:

'the river (River Bernam) here is most lovely, but the district is quite uninhabited and uncleared' and 'The Bernam river by the construction of seven miles of canal, could be shortened by about 57 miles of its present length, but those canals must be both deep and wide if they are to be useful at all times of the year' (Swettenham, 1885: 2).

In another meeting his concern for trade routes led him to suggest that the east coast road, from Pahang north to Johore south, should be established to make communications possible between Pahang Valley and Singapore, due to the unstable conditions of China Sea (Swettenham, 1885: 37). Thus Swettenham's purpose aimed to extend more link from Straits Settlements into peninsular Malaya. The officers' inspection tours, exemplified by the Swettenham, at least featured double meanings.

As one member of the high officers Swettenham himself not only acquired knowledge from the meetings and publications of the Straits Asiatic Society, but also conveyed his conception of environments and the people on this land through those meetings. Of course, these ideas were at times reflected as authority's scheme.

Another well-known D. D. Daly's work was made as visible as Swettenham's in metropolitan publication by Royal Geographical Society, although the former was paid no more attention than the latter in scientific sphere within Malaya. The purposes of Daly's surveying in Selangor in mid-1870 are fixing the position and jungle tracks thereto of the principal tin mines. His surveys radiated from Kwala (Kuala) Lumpur in many directions: namely, Kanching, Ulu Selangor, Ulu Bernam, Ulu Gombah, Ulu Klang, Ulu Langat, Sungie Puteh, Recko, Kajang, and intermediate places (Daly, 1882: 394). Without sufficient draughtsman and instruments, Daly was forced to make a sketch survey, according to Swettenham's personal observation of his work (Swettenham, 1875: 250). Therefore, even though he was an experienced surveyor who used to participate in one notable traverse survey in the Northern Territory of Australia, from Adelaide to Darwin, rigorous information could not still be expected from Daly's surveying.

Preparation of Sketch Maps

The duty of preparing Malayan maps was assigned to the Straits Branch of the Royal Asiatic Society in the early British administration, before the establishment of official departments in charge of the cartographical affairs. The cooperation between the Straits Settlements Government and the Straits Branch of the Royal Asiatic Society took place in several facets. The Government not only gave extensive material and financial assistance to the Society, but also saw that society as a means to integrate colonial knowledge from different perspectives in the early ruled period. The preparation of maps served as one of the supportive examples which the Society helped to produce and circulate the geographical conceptions within the spheres of the government departments, learned societies, and general populace. These cartographic materials, usually the sketch maps, comprise the illustrative drawings and the further processed maps. Sketch maps were clearly the product of not only the will of coloniser but also the progress of cartography. However, the ideal of the British authority is not possible to be fulfilled without appropriate cartographical technology and responsible offices. Sketch maps which outline roughly the mountain-chains, river systems and settlement or *Kampong* were frequently used before the topographical survey work had spread extensively.

The significance of producing accurate records and compiling appropriate maps

pertaining to the Malay Peninsula had been always in the minds of the British administrators as well as enthusiastic scholars. However, the promotion of this sort of work did need funding. And this was actually and primarily granted by the Straits Government. It was believed that a good knowledge of Malay Peninsula geography is a sine qua non for the colonial administration in this region. The following statement which appeared in early 1881 not only indicated the importance of necessary maps but also attempted to encourage the Straits Society members for collecting any available environmental information. The Council reported that:

'The urgent need of this map⁴³ is admitted by all; several new geographical and topographical discoveries have been made, even during the past year, and, with the basis of this new map to work upon, it may be hoped, with the assistance of members and all who are interested in such a matter, to produce, in a few years' time, an accurate and useful map of the Malay Peninsula' (Annual Report of the Council of the Straits Branch of the Royal Asiatic Society, 1883: X VI).

The Straits Society was granted funds to conduct and circulate the geographical work. The Treasurers of the Straits Society did not need to worry about the financial state of the institution, as they always claimed that it was good or healthy. Most of the Straits Asiatic Society's funding came from the budget of the Straits Government, except from the subscriptions for publications and the sale of its Journals and maps. For example, W. E. Maxwell, the Honorary Secretary of the Straits Society, pointed out that in 1883 alone a sum of \$ 400 was expended for the Straits Government in the production of the work on geography, according to the Honorary Treasurer's accounts (Annual Report of the Council of the Straits Branch of the Royal Asiatic Society, 1883: X VI). Another strategy of the Straits Government to share the running cost of the Straits Society was to take charge of the printing liability. Printing jobs of the Straits Asiatic Society's Journals were originally undertaken by A. Frois at the Straits Times Press, a private company. From the July of 1880, however, this work was transferred to the hands of the Government Printing Department. It was reported that the Society was granted permission by the Government that its Journals may be printed at Government expense (Annual Report of the Council of the Straits Branch of the Royal Asiatic Society, 1881: X II - X III).

No authorised and independent survey or mapping offices was established in the Malay Peninsula before the last quarter of the nineteenth century. Therefore, the early Malay Peninsula maps were almost all prepared by the Straits Society. The first Malay Peninsula

⁴³ This map was eventually released as *'Map of the Malay Peninsula 1887'*.

map which was published under auspices of the Straits Branch of the Royal Asiatic Society was open to the public in 1887 and it was also a collective work of the Society Members. Individual and isolated information acquired from the fieldwork fail to form a system of knowledge, without being brought together into a form enabling communicating, negotiating and disseminating. It is possible, needless to say, to be regarded as the referencing base for administration, as the members of the Straits Society were usually the officers of colonial departments.

The Map of the Malay Peninsula 1887, in fact, had taken a considerable time and work from its initial proposal to final publication. Maxwell reported the plan of a new map, as early as in the Annual Report of the Council of the Straits Branch of the Royal Asiatic Society for 1883, due the third year after the publication of the Map of Malay Peninsula 1881. He said that:

‘With the object of extending our knowledge of the Geography of the Peninsula, arrangements have been made for the preparation, for the use of the Society, of a skeleton map of the Peninsula on a scale of a quarter of an inch to a mile, upon which all new information will be entered, from time to time, as exploration advances’ (Annual Report of the Council of the Straits Branch of the Royal Asiatic Society, 1883: X IV).

The 1879 Malay Peninsula map which was compiled after the British intervention was completed in 1879 and published in 1881. It was completed by Edward Stanford, a well-known map publisher (J. B., 1904: 686-687), on a scale of 12 inches to 1 mile. According to the Treasurer’s Cash Account for the year 1881, furnished by Edwin Koek, \$527 was paid to Mr. Edward Stanford to account of Map of Malay Peninsula (Edwin Koek, 1882: X V). One copy of the surviving and intact 1887 map is preserved in the National Heritage Board, National Archives of Singapore.

Documentation and representation of the Malayan environment in early sketch maps did display their own features and preferences at some extent. In general, the new British possessions were described as territories of agricultural promise and mineral wealth. In detail, the complex tropical landscape of Malaya was perceived as a collective of several distinct elements. It makes sense to reconstruct the environment and territory which the colonial authority perceived and attempted to govern, through analysing the maps which they had compiled. The maps do not simply represent the territory as found, but respond to the modes of inquiry, the interests and forms of representation that reflect the colonisers’ interests and habits of thought. In other words, what we are representing and discussing is the British Malaya, rather than the ‘true’ Malaya. Inspired by the notions exemplified by

Matthew Edney's examination of the Indian Great Trigonometric Survey that found '*representations of the world-whether numeric, written or graphic-are bound up both with the acts and conditions of observation and inscription and with the subjective condition of the observer.*' He continues to claim that the metaphorical archive stands for the discursive field of knowledge-representations which constitute our understanding of the world (Edney, 1997: 39-41).

The British archive for the Malay Peninsula geography comprised all the various maps, statistics, and textual descriptions which they produced, all of which are embedded in the empire's complex social, economical, and political negotiations. In particular, the British representations of Malaya as possibilities for mining and productive agricultural land find its origins at the very early period of British intervention. The documentation of tin-mines and tropical plantations which had commenced their developments before the British involvement prevailed in the journals and records, whether private or public individuals. However, I would not like to touch the individual or non-official representation of Malaya, as this research concerns especially the kind of knowledge produced by governments.

Some narrative words, in addition to graphic representation of landscapes, were developed to feature the perceived environment as well as refer to the prominent landmarks. The literal legends which were engraved on the maps could be read carefully, as they also perhaps represent some meanings there. For example, the Malay words or short remarks which were marked on Daly's 1882 map (Figure 5-5) reflected the concerns of land surveyor or map compiler's specific. Daly was, definitely, one of the persons who were doing this kind of performance at this time; and it reveals parts of the environmental conceptions being prioritised.

The Malayan environment, in this light, was recognised as the construction of only a few elements. On the one hand, these Malay words or their abbreviations which comprise of Bukit, Gunong, Kampong, Kwala (Kuala), Pulo (Pulau), Sungei (Sungei), Tanjong, and Ulu feature the physical environments and position the distribution of settlements in Malaya. For example, *Sungei* means river in Malay while *Kampong* refers to village (Table 5-1). It is worthy of attention that most of these words portray the natural outlook of relief physically, while two of them, namely *Kuala* or *Ulu* which were inherited from the Malay language itself, not only referred to the lower or upper section of rivers comparatively but also claimed the living territory of Malay races. Curiously, no forest relevant legend was created, even though it did constitute the important portions of Malayan landscape. Nevertheless, they remind the readers which factors constitute the fresh environments of the British Protectorate, through the presentation of sketch maps.



Figure 5-5 Portions of Daly's 'Map of the Malay Peninsula', 1882

Source: Daly's *Surveys and Explorations in the Native States of the Malayan Peninsula, 1875-82*.

Table 5-1 Malay words and its English meaning

Malay	English	Notes
Gunong	Mountain	Physical
Bukit	Hill	
Sungie	River	
Jeram	Rapid	
Tanjong	Point, Cape	
Pulo	Island	
Kampong	Village	Human
Kwala	Mouth of River	Complex
Ulu	Head of River	

Source: Daly, 1882 'Map of the Malay Peninsula' to accompany his paper.

On the other hand, some indicative words and evaluative notes were expressed on the maps. Note that the tin mines highlighted in Kanching, Ulu Klang and Ulu Langat near the backbone hills of upper Selangor state as well as the gold mines found in Chindrass of Negri Sembilan. In addition, some of Daly's remarks would suggest the locations of

suitable lands for agricultural development. For instance, the area which surrounds the Bernam River was described as ‘*low country but fertile*’ in his sketch, even though Daly had spent very little time surveying there.

‘The low lands that fringe the coast of Selangor are partly covered with mangroves, which grow in heavy clays and blue mud. These lands have been found in Province Wellesley to be well adapted, after drainage, for sugar plantations’. He added that *‘the mangrove trees that are cleared off are turned to profit to the planter by being cut up into lengths for firewood’* (Daly, 1882: 396).

Economic-geographic oriented environmental knowledge in relation to Malay Peninsula was documented in numerous descriptive records as well as the sketch or skeleton maps in the early British administration. Through the only semi-official organisation in the British Malayan colonies and protectorates, namely the Straits Branch of Royal Asiatic Society, a range of reports and papers with their enclosed graphical illustrations which were made by explorers and officers published and circulated extensively. Not surprisingly, many of the geographical conceptions which were produced by the aforesaid individuals could be dispersed to and through other types of networks, such as the learned societies based in metropolitan and other adjacent regions. Although the archives of commissioning surveys are too fragmentary to prove that all surveys of this stage were performed on the basis of agricultural and mining concerns, the affairs which are related to mining and agriculture seem to draw the surveyors’ attention. Nevertheless, this section of the chapter comes to a brief conclusion that the environmental discourses or territorial images of Malay Peninsula were assembled from these numerous but sporadic overland or trans-journeys. Among these, the exploratory records with sketch maps especially impressed the private and public intellectuals and were broadly dispersed within them. These visual cartographical attachments make the survey archives of Daly and Swettenham much more accessible than other contributions. Eventually Sir Swettenham had higher reputation within the social sphere and stronger influence on the colonial administration than Daly. They also enforced the forthcoming operators of formal and comprehensive surveying to adopt and incorporate their fulfilments. Certainly, this could be made possible to make sense and circulate the descriptive and cartographical information, as the Straits Society was the unique knowledge producing and circulating body in the early British ruling period.

GROWTH OF KNOWLEDGE

Institutional surveys initiated since the 1880s meant the remarkable enhancement of the geographical knowledge pertaining to the Malay Peninsula, although the main purpose of

these surveys was to improve the land revenue and to assist the governmental administration. Among the various achievements which were made by the Survey offices, the preparation of cartographical materials may serve as one of the proper examples. For instance, a solid evidence for this function is that the work of the survey offices enabled the land department to fix on the maps the positions of the various holdings (PGG, 1891: 460). Therefore, the forthcoming paragraphs will concern primarily about the preparation of base-maps for assisting the administration and examine the metaphors embedded in these significant maps.

Device of the Survey Offices

The device of Survey offices in British Malaya always aimed to assist the land revenue collection, although these offices had apparently their official and administrative origins respectively. In most of the cases, these departments were directed to conduct some environmental surveys and to supply essential information to incumbent governmental departments as well. However, the role and duties of Survey offices had been questioned and challenged steadily over decades since the 1890s. And this perhaps represents the exact intention of the British colonial authority. The British administrators had chosen to develop intimate links between survey departments and land offices or even to subordinate the former organs under the control of the latter. Owing to the limited records available, most of the information relating to the personnel and their work was based on the statements found in annual reports for the survey offices.

Survey offices in separate States of the Malay Peninsula had no common source within the similar administrative framework which had been based on the Residential system. In fact, the governmental branches of this nature could trace their origins to different predecessor public units in Malaya or even the official departments in other Eastern Colonies of the British Empire. Accordingly, the equivalent objects, duties, and results one might expect to be undertaken in Survey offices might either not occur or take place in diverse different offices in the Native States of the Peninsula.

All sorts of survey offices were essentially collectives of technocrats, although a considerable difference could occur between the institutions. Therefore, the heads of these offices were generally called Chief Surveyors. These Surveyors were usually employed mostly on land survey and topographical (environmental) measurement of already colonised areas, with few tasks related to exploration duty. The first overarching survey unit, the (*General*) *Survey Department* of Perak, was expected in 1888. In the meanwhile, the survey staff of the Selangor State were still subordinate to the Selangor Land Office.

However, an independent Selangor Survey Department was separated from the former Land Office in 1891 (The Administration Report of the State of Selangor, 1892 : 14).

The survey work in British Malaya was highly correlated with the progress of the land administration system. It was reported, for example, by William E. Maxwell, the British Resident of Selangor, that the full value of the survey work done in 1890 will not be apparent until the re-organisation of the Land Office is more forward and the new Land Code is in operation (Selangor Administration Report, 1890: 18). In addition, there seems to exist some commonalities across British colonies that there were strong and intimate links between survey departments and land administration. As Ian J. Barrow (2008), in his book on surveying activities in colonial Sri Lanka, observes and suggests that the survey work was mostly devoted to mapping blocks of government-owned forest land as a necessary step towards their transformation into estates. Surely this was also going to be the case here in Malaya.

The surveying of British Malaya is pragmatic in essence. That means the survey operations followed immediately the land application and occupation, owing to the demand in properties declaration. For example, G. A. Lefroy who served as Chief Surveyor of Perak and supervised the Survey Office of this State, made the following statement suggesting that the government should promote further aggressive endeavours to triangulation, as '*the rapid extension of settlement in the Kinta, Batang Padang, and Lower Perak Districts*' in the *Annual Report of Survey Department for Perak, 1888*. He claimed that '*it will soon be found absolutely necessary that the triangulation should be extended to the eastern frontier*' (PGG, 1888: 263) .

A new era of surveying had come after the establishments of land survey institutions in the Protected Malay States. Survey institutions emerged swiftly since 1880s, but a wide variety of contest, cooperation and reconciliation made their occurrence within these units as well. These survey-related offices primarily consisted of the Land Department, the Survey Department, the Revenue Survey Department, and the Public Works Department. The Land Department was first established in 1880s, in response to the burgeoning land applications and development in the new protected Malay States. It was taken for granted that the department was also in charge of land survey affairs. The early 1890s saw the isolation of survey branch from its host office as the new organ *Survey Department*. Since then both of these two institutions were responsible for survey works. However, the responsible tasks were not always distinguished from this to that clearly. Even though one Acting Resident of Perak questioned the ambiguity of these two departments' responsibilities in the Annual Report of Perak Government in 1892 (Perak Government

Gazette 1892, No.243), the coexistence lasted for more than a decade. In addition, the Revenue Survey Department, the original the branch of the Settlement Officer was also segregated from the Land Department.

The Public Works Department, in addition, operated surveying with reference to engineering as well. Its survey work sometimes needed to be undertaken through the negotiation and cooperation with the Land Department or Survey Department. One set of survey task disputes within the different sectors of government will be analysed here. For example, in one case about the suitability of very low land between the Bernam and Selangor rivers for padi cultivation, what institution, the topographical branch of the Survey Department or the Public Works Department, should take charge of the elevation survey and which could provide necessary information for drainage plan, absorbed much attention (Secretariat Selangor 3719, 1915; Secretariat Selangor 3635, 1916).

Compared to the above mentioned sporadic explorations in the *Deficiency* stage and *Commencement* stage, the 1880s witnessed remarkable progress in the growth of environmental or geographical knowledge on several provinces which was of interest to the British authority in the Malayan Peninsula. Surveyors' explorations had added so much to our knowledge of the Native States of the Peninsula. Extra exploration duty and inspection work were often assigned to the diligent surveyors. For example, T. W. Raymond, a Surveyor affiliated to the Selangor Land Department, made a time and compass survey of the route from Ulu Langat to Jelevu, while G. M. Stafford, the colleague of Raymond, was employed for four weeks with Capt. Syers, Capt.-Superintendent of Police, on a very arduous journey of exploration in Jelevu and the frontier of Pahang. (Selangor Administration Report, 1890: 17) Another instance was reported by J. Brewster, Acting Magistrate and Collector, Kinta. He said that: '*a lot of good work has been done by two Sub-Assistant Surveyors lent me from Larut, and I have a year's work now ready for each of them in surveying mining blocks only*' (PGG, 1888 No.150 Kinta Monthly Report: 119). These environmental surveys enable the accumulation of geographical knowledge. F. W. Mais, an experienced surveyor, for example, claimed that: '*I find that such surveys are the means of giving a good deal of information regarding the general features of the country*' (PGG 1890: 249).

Metaphor in the Revenue Survey maps

The need for the map compilation as well as the land survey originated chiefly from the initiation of a system of registration of holdings or occupied lands. In the Torrens system which was based on the mode exercised in the British Australian Colonies and was

introduced by William. E. Maxwell, all transfers, charges, etc., affecting lands under lease or grant would be registered in the documents and plotted in the sheets. If the distribution map of resources was intended to inspire capitalists' investment, the alienation lots sketch or *Revenue Survey Sheet* was compiled to coincide with the demand of colonial administration.

The production of a general map of State had been the one of chief duties for the Survey Department, though it was delayed due to the small staff of this department. The phenomenon was reported vividly by the head of the department that:

It is impossible to collect material for the general map with sufficient rapidity with only one Officer available, and this has been practically the position of this department during the last two years (PGG, 1889 No.120: 263).

These two professional departments of each State Government, the Trigonometrical Survey Department as well as the Revenue Survey Department, helped together to prepare the Revenue Survey Maps which were crucial to land administration. Trigonometrical survey had a more practical effect, giving surveyors the ability to make sure their topographical and revenue maps were accurate. The Surveyor was detached from his regular work and employed on what may be termed preliminary trigonometrical survey work: fixing points, erecting stations, and taking observations to connect existing work with points. Taking the work of Surveyors in Perak State for example, forty-five miles of road survey and 83 miles of river survey were done during the year of 1890, plotted, checked, reduced, and placed on the one mile and four miles to the inch maps that gradually brought the State into visibility (PGG, 1890: 461). In addition, the Survey offices took charge of supplied information to various branches of the administration, especially the cartographical materials (PGG, 1897 AR1896 Report by the Surveyor in charge of Computations: 80). The Revenue Surveyor (originally Settlement Officer), on the other hand, with suitable equipments, such as a *plane table*⁴⁴, the staff can prepare fairly accurate sketch maps of small holdings which will enable the Land Officers to ascertain the area quite nearly enough for revenue purposes, and define the boundaries between adjacent lots.

The Survey Department in the State of Perak was formed earlier than the parallel department in Selangor, but the first Revenue Survey map ever appeared in the Malay Peninsula was released by the government of Selangor State in 1895. The Perak Survey Department which was founded in 1889 published the first Perak map titled as '*New Sketch Map of the Protected Malay State of Perak 1892*' (CO700/ STRAITS SETTLEMENTS 23)

⁴⁴ A plane table (plain table prior to 1830) is a device used in surveying and related disciplines to provide a solid and level surface on which to make field drawings, charts and maps. The early use of the name plain table reflected its simplicity and plainness rather than its flatness.

in 1892. This 1892 map attempted to portray a whole image for the State, but the new expression of Revenue Survey class was not developed then. The 1892 map was at best one of the skeleton maps. The first Revenue Survey map was finally published in 1901 (Figure 5-6). Every five years or at longer intervals, the Revenue Survey Departments of each State would publish state sketch maps, revenue survey maps or other named maps.

Surveying, in comparison, is the investigation and recording of geographical information merely, while mapping is the spatial representation of the same material. In other words, mapping gives something a uniquely territorial dimension. In terms of the spatiality of colonial knowledge production, the de-territorialisation was realised through the process of surveying at first, and then the re-territorialisation was furthered by mapping. Some geographical and administrative metaphors are not difficult to be felt in the sketch map and the Revenue Survey map. The similarities are that both of the statistics significant to the colonial administration and some dotted as well as linear spatial information were recorded. The spotty information meant the names of places, hills etc, while the linear message were the roads, rivers, and district lines. In addition, the coloured blocks were designed to indicate the alienated land patches or holdings. In the *Map of Perak 1901*, for example, some mining land was coloured in blue while the agricultural land was displayed in green are lithographed in this 1901 map which shows the whole portion the State of Perak administered. It is not difficult to observe that the alienated lands for the above land utilisation patterns overlapped directly on the sketch maps rather than contour maps. In fact, the comprehensive contour maps which mean Federated Malay States Survey Sheets or Malaya Topographical Survey Sheet were not surveyed and compiled until the mid-1910s and mostly in the 1930s.

The Revenue Survey map which was surveyed and compiled by Survey Office is an exercise in administrative shorthand. Employing several coloured patterns, the authority was able to govern its ruling territory more effectively. By this, it was clearly aware of the relationship between revenue composition and regional character, for example, the considerable revenue decrease in Kinta Valleys was mostly owe to the income shortage from mining industries and their relevant sectors. Such simplification in colonial management, rather in land revenue but in social control, was also seem in some cases.



Figure 5-6 Revenue Survey Map of Perak 1901

Source: CO700/ STRAITS SETTLEMENTS 36

One ethnographic study in British India, for instance, suggests that the use of the singular, such as the '*lawless Maravan*', to typify an entire community of many thousands of men, women and children, was a common feature of colonial categorisation (Nelson, 1989: 16). Human beings were reduced to a single 'type', classified and ranked like plants or animals. Similarly, the creation of Revenue Survey maps since the 1890s reflects not only the British knowledge of Malaya but also their demands in colonial administration. Promoted by the advancing of Topographical Survey, much more precise position could be

measured and plotted. In other words, the classificatory system, whether land or people, provides convenient administration shorthand.

Several independent and responsible departments or offices were created in the protected Malay States to conduct surveys, not alike the case of Japanese Taiwan in which the central government of colonial authorities would settle the affairs of investigation under the industry-related government organs. Surveying and mapping constituted most of the work of Survey offices. All surveys were plotted on the sheets of larger scale, and then transferred to the State sketch map of small scale, if applicable. Map compilation, thus, became the important means to facilitate colonial administration, with special reference to land management. On the one hand, the staff worked on a range of surveys, such as triangulation, topographic survey, baseline measurement, river survey, road survey, coast survey, mining survey, revenue survey, allotment survey, and so on. On the other hand, one of their primary duties was to produce proper maps which elaborated the land revenue and local administration.

The choice and compilation of base-maps type, namely the Revenue Survey Sheets and maps, for land revenue and administration in British Malaya reflected the attitude toward not only the perception of the environment but also the development of the industries.

CONCLUSION

Through the examination of the early British cartography in Malaya, this chapter investigates the entanglements between the government, science, and environment. By practicing the exploratory and surveying activities, the colonial government first employed the semi-official organisation, namely the Straits Branch of the Royal Asiatic Society, and then established its own survey offices to be familiar with the new tropical Malayan land. One of the influential achievements is the preparation of the Revenue Survey Sheets and maps which could be regarded as one of essential means to the complete control of Malaya land.

This chapter, of course, concerns about what landscape the explorers and surveyors actually saw, but it is much more interested in how this landscape was recorded, represented, and evaluated. The British case-based survey, resembles the Japanese enterprise-oriented one, was determined by its own attitude to face its territories or dependencies respectively. The ways in which the British conducted land surveys in Malaya displayed quite different appearances from the Japanese coloniser, her contemporary and counterpart. Aforesaid discussions in connection to Japanese explorations in Taiwan has shown that their surveying activities were almost organised and

undertaken systematically by government offices under the auspices of the central colonial authority in Formosa. Speaking more precisely, it was the industry-promoted departments to take charge of the environmental investigations in Taiwan through the whole Japanese administrative period. In contrast, not chiefly even little by the centralised bureaucratic power; the British surveys in Malaya were made by individual officers or separate domestic departments in the provinces. The tasks of the administrators were often appointed for inspection or official leave.

No overland surveys which spread all over the Malayan territory had been triggered by the British colonial authority until the 1910s and the 1920s, although few of technical staff from the British Isles or any countries of the European Continent were employed or invited to look into the potential of industries in Malaya. Most of the geographical facts were practically established by domestic colonial officers. A few but influential exploratory journeys were conducted by these kinds of active and enthusiastic bureaucrats and technocrats. The fruits of the domestic officers' work not only were reported and documented in official gazettes of separate States but also were circulated and exchanged within the semi-official network of the Straits Branch of the Royal Asiatic Society.

Another difference in the surveying work between the Japanese and British imperial regimes is that the former promoted actively a series of preliminary general surveys before her management was put into force actually, while the latter conducted numerous isolated surveys when the lands were required to be alienated and disposed. Of course, in terms of British surveying, this might resonate with Raymond Kennedy's term that Malaya is a colony without a plan (Kennedy, 1945: 225-226). Furthermore, this logic had produced the dual effects. On the one hand, it proved elastic and economic to form and to organise the survey offices. On the other hand, it led to considerable difficulties fitting such isolated surveys together. An obstacle to integration of land management followed as well.

The environmental knowledge which reflects the British governmentality in Malaya could be comprehended through the surveying and mapping of several main types of maps. Skeleton maps could be regard as the earlier representative and communicative medium for environmental conceptions and discourses, while the Revenue Survey Sheets and Maps which had been presented since 1890s become the base maps for the authority's administration in the following decades consistently. Each of their compilation of these two kinds of maps reveals characters respectively and continuously. The former maps which though positioning merely the prominent physical features, human activities and potential resources, are not insufficient to demonstrate the state of districts as well as to provide preliminary information for the policy formation of early British administration.

On the basis of the former cartographical materials, the latter series of drawings were therefore created. That is to say, the latter sheets and maps were the products which something was added on the former types. Furthermore, the latter pictorial documents not only enclosed the districts of land and resources the British perceived but also indicated obviously the distribution of areas they attempted to govern.

The Revenue Survey Sheets could be seen as one of essential means to the complete control of Malaya land by the British. Under the directions of colonial will, three rough land categories of agricultural, mining and reserves areas were surveyed by responsible institutions and marked on the Revenue Survey Sheets, or the coloured land utilisation maps. Initially, only the alienated agricultural land and leased mining land were marked. Later in the mid-1890s and mid-1910s, however, the forest reserve and Malay reservation were constituted and enlisted in this sort of map respectively. British representation of Malaya as exploitative mining and productive agricultural land finds its origins in the very early period of British intervention and continued to survive until the end of her rule.

This chapter has shown how the image of land which was described as mineral wealth and promising plantation was not only cartographed in a wide range of forms but also advertised through diversity of networks. In chapter 6, we will see how the land in Malaya was classified by its nature and demarcated on maps. Since then, through these coloured maps, refers to Revenue Survey Maps which were held in government offices, this British Protectorate of Malay States had been turned to be not only visible, but also manageable. Land revenue could be secured, while reserves maintenance seemed to be more efficient.

Chapter 6 Land Categories in British Malaya:

Successive Alienation of Mining Leases, Agricultural Lots, and some Reserves

INTRODUCTION

As part of this thesis aiming to approach the knowledge of environment through colonial science reflecting the governmentality, this chapter considers the nature of land classification in British Malaya. Colonial environmental knowledge, in this context, was the entangled outcome of government thought, colonial science and the natural environment. The notion of social nature would be adopted, although cultural landscapes are usually understood within physical geography to be landscapes transformed by human action. This correlation was therefore either constructed or framed by the ruling collectives through sorting and picking some useful or meaningful components. The complexities of the environment have been abstracted or distilled into several forms of knowledge amenable to and enabling the control and exploitation of land as well as resources. With the participation of colonial science, especially surveying and mapping, the governing authorities were capable of synthesising ideas and realities when defining and demarcating the land environment administered. Consequently the delineated and patterned territories, in this case land categories and lots, became one type of colonial hybrid geographies. The creation of cartographic representation since the 1890s, such as through the Revenue Survey Sheets or maps, not only signified the increasing British knowledge of the environment of Malaya but also reflected the demands of the authority in its pragmatic colonial administration. By this work, the land resources became spatially defined, administratively governed, and commodified. The Revenue Survey sheets (thence RS sheets) which were constituted from a series of large scale maps were one of most comprehensive and significant tools for the British colonists in collecting revenue and managing lands, such as mining pits, agriculture lots, forest reserves and Malay reservations.

The Malay Peninsula had witnessed a series of landscape changes insurmountable on colonisation from the nineteenth century. This region was originally jungles with some rice clearings made by the ethnic Malays. A colonialist judged that there was no air of business energy in this densely forested land before the tin was exploited as one of commercial resources. The largest tin fields in the world in the nineteenth century were found in the western Malay States, where hitherto the produce had been 'stream tin' only, the metal not having been traced to its veins in the rock, namely the 'tin lodes'. The main economic export in the nineteenth century was tin, but tin took second place to rubber by the mid

1910s. The land mosaic had been elaborated by the spatial delineation of forest reserve and Malay reservation since the last decade of the nineteenth century (Figure 6-1). All these changes did not take place naturally, but were triggered by enthusiastic officers, adventuring miners and speculative planters⁴⁵. More specifically, the land classification was chiefly framed and constructed by the British colonial authority in Malaya.

This chapter explores the ideologies of the British administrators in Malaya around land definition and demarcation. The focus will thus primarily be on the process of land categorisation. In terms of land demarcation or territorial sub-division, the British officers in Malaya had adopted a strategy which codified the land or occupied areas into a tenure system. No whole land classification framework and ready-made system of management had existed when the British power started to make her intervention in the administration of Malay Peninsula. By contrast, the British imperialists had tended to craft specific rules and regulations for individual land utilisation patterns as time passed.⁴⁶

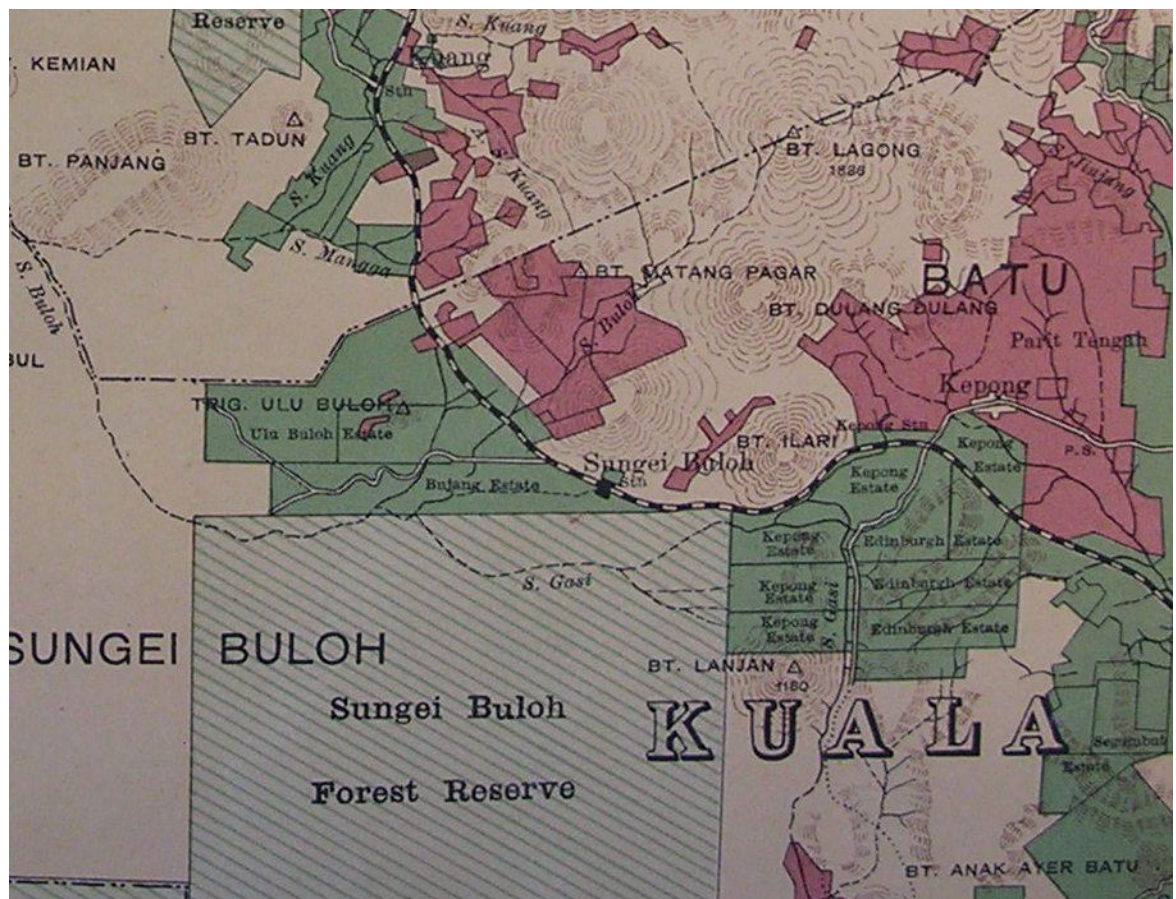


Figure 6-1 Land categories in Malaya, 1910

Source: Selangor, Federated Malay States 1910, CO 1047/885

⁴⁵ This is inspired by Jackson, J. C. 1968, *Planters and Speculators*, Kuala Lumpur: University of Malaya Press.

⁴⁶ See Zaki et al's work (2010)

Land alienation and settlement in British Malaya meant the guarantee of land revenue. The reason why this chapter is dealing with the land categories issues is that the items of land revenue in the Malay States were reflected by the land classification. The land revenue, rents, or duties were chiefly collected from the agricultural concessions, mining leases and forest reserves. Land rents and mining rents constituted the permanent revenue as well as were much higher than other important items of revenue which contained land sales, survey fees, and demarcation fees. Table 6-1, for example, shows the amount of revenue realised by different items in Perak for the year 1905.

Table 6-1 Comparative table of land revenue

Head of revenue	Amount(\$)
Land rents	432,282
Mining rents	258,813
Land sales	189,768
Survey fees	88,699
Demarcation fees	39,641

Source: PGG, 1906 Federated Malay States, Report on the Lands, Mines and Surveys for the year 1905: 1

The land units in relation to colonial administration were created and mapped by the British authority. The lands in Malaya, in general terms, were legally alienated by the British government for a number of reasons. To alienate, with its grammatical variations and cognate expressions, has the meaning of to sell, lease, or otherwise dispose of State land with some criteria. A range of land use units were thus defined, codified, and demarcated with the progress of further British influence. Such lands, for example, of mining lots, agricultural holdings, and forest reserves were taken up successively for private leases or grants and public purposes. In other words, these domains were standardised as bounded land masses legally and administratively. All registered land lots had been required to submit related sketch maps before their applications were granted. Afterwards, these lots were plotted by drafting staff who were affiliated with the Revenue Survey Department on the prescribed *Revenue Survey Sheets* which were deposited in the office of the Superintendent of Revenue Survey in each of the separate States. Every five to ten years, these Survey Sheets would be combined and reduced to the smaller scale *Revenue Survey Maps*. Therefore, we could confidently say that the healthy and efficient land administration in Malaya depended upon the establishment of the Revenue Survey Department and other similar official offices. An unexpected and astonishing complexity

of local land classification in British Malaya could be observed, when diving down into these sorts of colonial administrative archives.

The sub-division of land since the 1890s had not only represented the increasing British knowledge of Malaya but also reflected how that responded to the demands of the authority and enabled its practices of colonial administration. Compared to the categories of agricultural property and mining land which could be regarded as reconfirming ancestral land utilisations that existed previously, the forest reserve was a whole new product of colonial will. It was not till the start of the 1890s that land management policies received legislative sanction in a scientific and definite form. The control, management, and administration of lands would not be complete and sufficient, without legislation and related enactments and regulations which in turn required fixed and specifiable locations on connected cartographic documents. The circumstances attending the economic growth of the native Malay States were of a kind to put to a severe test the merits of the land policy of the Government. At the beginning of the colonial period, the land officers of the separate States had only to concern themselves with the needs of Malay agriculturists, Chinese tin-miners, and a small number of tapioca and coffee planters (Innes, 1914: 386).

A fragmented and small scale surveying system was thus adequate to answering specific requests and there was no comprehensive survey of land – especially that not already being commodified. The British officers, on the other hand, were not eager to develop parallel enterprises of territory demarcation and delineation as the Japanese imperialists exercised in Taiwan. Their Japanese counterparts undertook a series of systematic schemes or enterprises in connection to land definition and demarcation in the newly-controlled areas of Highland Taiwan looking at potential development in state sponsored initiatives. On the contrary, Malayan topographic sheets were not surveyed and compiled until the mid-1910s and mostly in the 1930s.

The land tenure system of Malaya could be treated as a hybrid of extensions from the existing British colonies. The land administration system which the British authority practised in Malaya, a relatively fresh protectorate or dependency, was mostly inspired from other imperial possessions and was then modified for the local situation.. The staff of the Malayan civil service was stimulated by some of contemporary colleagues, in terms of different land administration, in other colonies which were governed under the British Empire. The transmission of territory management experiences drew principally from the land and mining affairs from the Australia colonies, the plantation system from Ceylon, and the forest governance from the Indian Government.

In addition, another thing to be remembered is the fact that most of the laws and

enactments which came into force in the States over which the British first had influence and control, namely Perak State and Selangor State would be implemented later in other States. It suggests that our understanding to the Malayan land classification should start at and could be exemplified by the cases of the Perak and Selangor States. For example, F. Belfield, a Legal Adviser in a Committee which was appointed by the Chief Secretary to Federated Malay States aimed to revise laws relating to land, among which the Registration of Titles Enactment was, 1911, made such an explanation in the objects and reasons. He stated evidently that:

The provisions of the existing law which, originally adopted in Selangor in 1891, were some six or seven years later passed in the three other States,⁴⁷ are based upon an Ordinance passed in Fiji in 1876 (Belfield, 1919: 49).

The importance that land legislation aided the British takeover of land was clear, and this clarifies the role of government departments in the formation of the colonial environmental categories. The British intervention of land in Malaya was chiefly through the encouragement of registration. Registration of landholdings, known as Torrens System, triggered the modern land administration in the Malay Peninsula in the late 1890s and became the norm of the British government to territorial involvement. No one would deny the critical significance of this land system, but still scholars insist to look at some issues, such as the origin. For example, Bashiran Begum and Nor Asiah Mohamad argue that the introduction of Torrens system in Malay world under the British administration firstly took place in Labuan, an island lying eight kilometres off the northwest coast of Borneo, now one of the Federal Territories of Malaysia (Begum and Mohamad, 2009).

In the early period of British intervention, the conduct of registration was a little rudimentary. Basically this system aimed to achieve the commodification of lands. It supposed that landowners were desirous of bringing their land under the new framework. Landholders were encouraged to make title registration for their properties. The title-deeds were sent to a specific office, where they were examined, after this verification, they were entered in registers kept for this purpose. With a small payment, the government certified that the person named in the title had the right to dispose at will of his property. These titles may be employed as negotiable instruments for any conveyance and transactions. As seen as one of momentous infrastructures in British Malaya history, Swettenham recollected the performance of registration work as follows:

⁴⁷ This means other members of Federated Malay States, known as the Perak, Negri Sembilan, and Pahang States.

Until the administration was properly organised, with complete staffs of land and survey offices, it was impossible to undertake a regular land settlement. That has all been done since, but the object at first was to see that every man's claim was properly demarcated and roughly surveyed, that the owner was furnished with a permit to occupy, an agreement for lease, or a lease, and that he paid the annual quit rent. The leases issued are for 999 years or in perpetuity (Swettenham, 1920: 236).

Nevertheless, to demonstrate these issues mentioned above and more specifically to approach the ideologies of the British administrators in Peninsular Malaya on land category creation, this chapter is divided into three main sections. That is to say, it first considers the colonial ethic of land classification. Then it examines the process how the existing industrial and economic land uses were codified systematically. Finally the chapter closes by investigating some new designs of land classification, such as the Forest Reserve and the Malay Reservation.

FROM DIVERSE PRACTICES TO UNIFORM CLASSIFICATION

Tin mining and commercial agriculture, such as the cultivation of pepper and tapioca, had long existed in Malay Peninsula and were the major commercial and export activities before the advent of ardent British officers and planters. These aforesaid industries found their niches in different landscapes in separate corners of the Peninsula respectively. Tin mining was firstly developed in the hills and valleys of Perak, the northern sultanate, while the Chinese tradesmen who were based in Malacca and Singapore started to invest and to expand their plantation estates into the middle and southern frontiers in the Peninsula.

The British authority in Malaya attempted to superimpose a set of managerial systems on land and forest steadily after the 1874 intervention, although the Malay form of land tenure concept did exist. Usually the rules and enactments developed in the States of Perak or Selangor would become the models for ones in other States on the Malay Peninsula some years later. This partly reflects the tendency of British policy towards uniformity. For Malay customs, the doctrine of proprietary right being created by clearance and continual occupation for a period of time was general. However, for colonial government, rights in land can only be retained when they have been entered on some permanent record. Hence the formally mapped land system meets the demand to increase revenue and thus title issues prompted the earliest surveys and administration. As in other colonies, the effect of imposing this version of land ownership by use, and defining use as the transformation of and tillage of land removed various usufructuary rights to forest produce and resources.

Famously in North America it also meant classing as wild and natural areas that were in fact extensively modified by human use – but a use invisible to the land surveys. This alienation of common resource on its own had dramatic effects in mountain forests in India, but was also coupled for shifting cultivation and dry paddy with the effect of a snapshot of land under tillage at the time of colonisation being taken as the full extent of cultivation.

The systematisation or codification of land administration evolved primarily alongside the land legislation. The official control and management of land and environment would have commenced, if no related enactments and regulations were made. Experiments in land classification or disposal were made by the incumbent government offices in different Malay States respectively, during the early years of British presence. In those formative stages of territorial management, however, most of the systems of land definition and categorisation in separate administrative districts were rather neutral or still in their infancy. And there seems to be no distinct exclusion between respective land groups in each States. For example in one such pioneer legal documents- a provision in the *Rules for the Disposal of Lands in Selangor*, which was promulgated on the 27th September of 1877, for example, the lawful definition of the land classification in the State of Selangor were as follows:

Land will be disposed of as follows-

1. *For agricultural purposes.*
2. *For building on.*
3. *For special purposes.* (Government Notification No.247, 1877)

In those formative stages, the system of land definition and categorisation was rather general, but began to move into diversity. For example, almost simultaneously with the Selangor case, another land disposal rule with special reference to the territory of Sungei Ujong, now the south-western part of the State of Negri Sembilan, was presented in mid September of 1877. It devoted rather more attention, in this case, to matters concerning the clearing and planting on waste lands. One of the preoccupations was with preventing short leases, for periods of less than ten years, for the purpose of Gambier and Tapioca planting, as these belonged to exhausting crops and so resulted in land degradation. In addition, one clause in the above regulation pointed out carefully that the mineral rights were reserved, and would be specially provided for, the working subject to a Royalty fixed by Government. In other words, in the view of the Sungei Ujong authority, the land tenure separated agricultural patch and mining lot. Still another case pertains to the Perak State. According to the Perak Land Code of 1879, State Land was divided into the categories only of Waste Land, Malay Reservation, Building Land, and Mining Reserves. Of which, Waste Land included forest land which was alienable for agricultural purposes (Perak State

Council Minutes, 28 Oct. 1878).

The need for the map compilation as well as the land survey originated chiefly from the initiation of a system of registration of holdings or occupied lands. In the Torrens system which was based on the mode exercised in the British Australian Colonies and was introduced by William Edward Maxwell, all transfers, charges, etc., affecting lands under lease or grant would be registered in the documents and plotted in the map sheets. If the distribution map of resources which was often seen was intended to inspire capitalists' investment, such as Daly's 1882 Map, the alienation lots sketch or *Revenue Survey Map* was compiled to coincide with the demand of colonial administration.

SYSTEMATISATION OF MINES ADMINISTRATION

This section discusses the origin, development, and codification of tin industry. The mining activity had survived in the northern part of Malay Peninsula since the mid-nineteenth century, though the first Mining Enactment in Malaya was not released until the year of 1904. It was Larut area initially then Kinta valley which was from about 1880s occupied the leading status for tin export. The mining legislation was one of the measures to encourage tin industry.

It was reported that the first tin miners were Malays, rather than Chinese or Europeans. The tin mining industry in the western Malay states was attracting investment from European and Asian merchants based in the Straits Settlements from about the middle of the nineteenth century, at the same time as Chinese miners were progressively replacing Malays for whom production had been a part-time activity (Wong, 1965: 43-47). The total amount of capital invested is not known with any exactitude, but Khoo Kay Kim concludes that 'a great deal' of Straits capital had been placed in mining ventures (Khoo, 1972: 108). Much of this agricultural and mining activity was directly connected to the growing participation of the British-controlled Straits Settlements ports.

Tin had been an article of export in Malaya during the middle years of nineteenth century. Initially it was from the Larut area then from about the 1880s the Kinta valley became the leading source for tin exports. Prior to the mid nineteenth century Larut, a coastal region constituting the frontier of Perak sultanate was largely ignored. It was a swamp country by the coast of Larut consisting of a maze of interlaced tidal creeks and rivers. A narrow tract of country, situated between the Perak watershed and the sea, it may be said to have come only within the sphere of influence of the older river-state.

There was no lack of descriptions relating to the mines in Larut. Although the Larut mines were assessed as one of the promising tin mine areas in the East, they had

simultaneously the worst evaluation as regards to their primitive production techniques. On the one hand, the mines in Larut were the subject of great expectations. An 1879 British mining engineer's map of the mining districts of Larut, near Taiping in Perak, is instructive here. This series of primarily Chinese-worked tin mines in Larut generated Malay royal revenue; but were also the site of disturbances among Chinese mining district leaders, and among the Chinese and the Malay Sultans and petty chiefs, that endangered what were fast becoming strategic British colonial resources for international trade. With British technological innovation, political control, and economic interest, Perak's tin mines would show increased production and greater profit. Larut's tin deposits, the engineer proposed, 'exceed in richness those of any other tin-producing country in the East' (Doyle, 1879: 1). On the other hand, some cautionary comments were provided as well. For example, Captain Speedy wrote in 1874: '*The process of tin mining in Larut is very simple. The mine is simply an excavation in the form of a square, averaging an acre in extent and penetrating perpendicularly to the strata containing the tin. This is generally found in the plains at a depth of from 20 to 50 feet, though at the foot of the hills it lies within six feet of the surface. With the exception of a simple but ingeniously contrived water-wheel, no machinery is used in the mine*' (Straits Settlements Gazette, 1875: 277).

The rise of Kinta put an end to much of this. It took the mining out of the hands of a few capitalists and offered the labourers a life of greater freedom. Between 1884 and 1889 the Chinese mining population of Kinta grew from 5,000 to 45,000 and outnumbered that of Larut. This was made possible by the settled conditions resulting from British political control and the opening up of the country by road construction. In Kinta a large number of independent employers embarked on mining ventures and "the Larut coolies ran away in hundreds and began to work in the smaller *kongsis* in Kinta under new *towkays*. Kinta is a district in central Perak some fifty miles north of Larut which has proved to be the main tin-bearing area of the country. After British administration had brought law and order to Perak and had encouraged economic development by improving communications and opening up the country, the mining potentialities of the district began to be exploited. The main town of Kinta which sprang up as a result was Ipoh, the present capital of the State, which is the acknowledged centre of Malayan tin mining.

Several researches concerned about the attempt of the Government to the tin mining. For example, Emily Sadka considers that 'To the administrators of the nineteenth century the immediate problem was economic: how to fill empty lands, develop mining and commercial agriculture and establish a modern system of communications' (Sadka, 1968: 381). Wong Lin Ken also concludes that, for the tin industry, government aimed at creating

a favourable environment for private enterprise, whether European or Asian-owned, though the practical effects of the mining legislation tended to favour western methods of operation (Wong, 1965: 237-238).

The effects of colonial rule are more clearly visible in the sphere of metropolitan intervention in the Malayan economy in the latter decades. Before the First World War the local British administration had been allowed a considerable measure of discretion by the Colonial Office in the matter of economic policy. But from 1914 onwards the imperial government increasingly arrogated to itself the final decision in questions with broad implications. This commenced with the control of all shipments of tin and rubber from Malaya by means of a London-based committee to prevent these strategic goods reaching enemy hands during the war. Malayan companies with registered offices in the United Kingdom came under a general Treasury ban on further issues of shares to raise capital. In 1917-18, after American and Japanese interests were reported to be seeking large land concessions for rubber, the British War Cabinet over-ruled the more optimistic views of the High Commissioner-Governor of the Straits Settlements and the Malay States, Chief Secretary, F.M.S., and instructed that all dealings in rubber lands over fifty acres be prohibited.

The first Mining Regulations which were opened to the public in the early 1890s suggested the lawful segregation of mining lands from the general sets of lands classification. Before the issue of the Mining Regulations of 1891, the affairs of the mining industry were administered by the General Land Regulations of 31st January, 1885, particularly the clauses 35 to 44. (PGG 1891 No. 431 Mining Regulations) One of the purposes the new 1891 regulations attempted to pursue was to strengthen the control and management of various kinds of mining activities. For example, the main type of mineral tin exploitation in this period focused on alluvial mining rather than lode mining, although this regulation attempted to include both of these two modes. Even though in the State of Perak in 1896, there were only two mining companies whose attention was put on lode mining, all other mine owners were still concerned with the alluvial mining. The paragraph 3 of the Mining Regulations of 1891 indicates that:

All applications under this order in Council shall be made to the Commissioner of Lands in Larut, or the District Magistrate in other districts, and shall specify the metal or mineral intended to be comprised in the lease, and whether it is for alluvial or lode mining (PGG, 1891: 902).

The trend in the codification and federalisation of laws in 1910s also had a considerable impact in the Malay States. Some enactments passed by the Federal Council and applied to

the four States of the Federation. Unified style of administrative system, including the land management system, was therefore created in the Malay Peninsula. The situation was true, although J. R. Innes, Barrister-at-Law, Judicial Commissioner, one of colonial officials with experience and respect in Federated Malay States made these claims as follows:

They introduced no new principle into the land law and were evidently intended to effect nothing more than to remedy the inconvenience occasioned by the existence in the four States of separate land laws which were the same in substance but were sometimes expressed in different phraseology. The position in Australia under the Torrens Acts of the different States is somewhat similar, and Australian jurists have called attention to the need for the codification and federalisation of those laws (Innes, 1914: 387).

CODIFICATION OF AGRICULTURAL PLANTATIONS MANAGEMENT

The plantation agriculture which followed the mining industry became the second main category in Malayan land administration. However, the development of plantations still stayed at its early stage and had not been paid remarkable attention neither until the 1880s and 1890s. In other words, the last quarter of the nineteenth century in most of the Native Malay States was duly experiencing the changes of industry sector and production mode. They not only saw the increasing share of plantation industry within the whole Peninsula economy framework, but also witnessed a significant economic transition which was from the exploitation of jungle products and timber to the production of agricultural and mineral resources.

Rubber, which is known as its development proceeded at a pace outstanding in tropical agriculture, was actually a succession of other commercial crops which had been introduced in Malaya at various times during the nineteenth century. According to a reputed and typical contribution by James C. Jackson, *Planters and Speculators*, these crops had involved 'shifting' forms of cultivation in the cases of gambier, pepper and tapioca (largely Chinese enterprise), and 'sedentary' forms for sugar and coffee (in which European participation was extensive) (Jackson, 1968). Though non-indigenous strains of rubber-yielding trees were first introduced into South and South-East Asia in 1876-77, it was not until after 1900 that this crop was widely planted for commercial purposes (Drabble, 1972: 247).

In fact, the local government did not hesitate to promote the agriculture in its own territory in the nineteenth century. For example, an officer in the State of Perak reported that: the country is mainly dependent on its mineral and agricultural resources to raise

Perak to the position of a planting State, such for instance as Ceylon, the introduction of European planters and planting companies is a sine qua non (PGG, 1892).

The production of the mining industry at all times went beyond the plantation agriculture. For instance, a planter in Selangor State made a complaint about the ignorance of the Government on plantation industry in the earlier 1890s. This agricultural estate owner at first reported the progress of this sort of agricultural production in the Selangor region that:

It is only a few years ago that the first coffee estate in Selangor (Weld's Hill) named after the late Governor of Singapore, was opened; but now the European plantations amount to no fewer than fifteen. (Planting in Selangor by a Planter: 4)

With regard to transportation infrastructure, he questioned with regret whether if the preference of the authority was rather on mining than on plantation:

Again, why should all the roads in the country be made for the benefit of miners and none for the planters. (Planting in Selangor by a Planter: 4)

No noticeable progress had been made in the extension of commercial agriculture, prior to the formation of the Federated Malay States (F. M. S.), originally the States of Perak, Selangor, Negri Sembilan and Pahang, in 1896. According to John H. Drabble, in these Malay States during the period, there was nothing which could be described as a closely-formulated agricultural policy, common to each, nor on related matters such as the tenure of land. The separate authorities in these States made whatever arrangements they conceived to be best suited to local conditions. The major planted crops differed in each locality (Drabble, 1973: 14). The situation was dramatically altered after the fever for rubber cultivation.

The plantation economy soared because of the incidence of the rubber boom. The first two decades of the twentieth century saw the rapid expansion of the rubber industry, with sterling capital companies registered in the United Kingdom occupying a pre-eminent position. A trend of explosive spread was experienced during the opening decade of the twentieth century. At the turn of the century, the main concentrations of cultivation were between Kuala Lumpur and Klang (Selangor), the Matang coastal region of Perak State and around Seremban, its capital town, in the State of Negri Sembilan. Afterwards, a great number of rubber plantation estates were established mostly over the west Malay States and fewer farms could also be found in the east coast of the Peninsula. Most of the agricultural cultivations were located in the lower plain countries, especially along the easily accessible districts, such as the neighbourhood of railway and cart roads. The areas

where cover the Mukim of Batu and the Mukim of Sungei Buloh, the northwest of Kuala Lumpur Town, for example, were seeing the scurry of plantation estates along the railway line since the early 1900s. The rise of economic farming came partly from Governmental encouragement and partly from the appealing benefits. The British administrators in the Malay States not only offered from time to time certain specific inducements to planters but also enacted sets of land rules to establish the general principles under which land could be legally and securely held (Drabble, 1973: 15).

In accordance to the increasing and urgent demand for land investment and development, the Land departments were reorganised and some important branches at the same time were formed independently. The land revenue, therefore, would be improved, as the departments were actually in charge of both the management of existing properties and the settlement of new lands.

In Malaya, it is not strange to note of the introduction of an alien administrative management system from other areas by the British officers. The Torrens system of registration of land title, which originated from the Australia colonies, was one of the well-known examples and did make considerable impacts. J. R. Innes was also clearly conscious of the uniqueness of the Malay Torrens performance. He reminds us that the Federated Malay States, in terms of the land system, deserves the attention of those interested in the land legislation of the British Dominions, Colonies, and Dependencies. Innes continued to demonstrate that because the Federated Malay States furnishes the only instance of the adoption by an Eastern country under British rule of the Australian Torrens system of registration of title almost in its entirety (Innes, 1914: 386).

DESIGN OF FOREST RESERVE AND MALAY RESERVATION

The profit collected from the forest reserves constituted the third item of land revenue. Although the forest exploitation did not necessarily made its occurrence in the Reserved Forests, these Forests did serve as the main territory for forestry. The revenue relating to the forests was thus collected. For example, the bulk of the good timber for railway sleepers was extracted from the State Land. And its practice was based on the Forest Department's deliberate policy of utilising timber on alienable land. It is said that the State Land Forests in 1904 supplied 96,000 sleepers, mainly of heavy-hardwood, *cengal* and *resak* (*Vatica* and *Cotyle-lobium* spp.), according to a report for forest administration in the Federated Malay States (Cited in Kathirithamby-Wells, 2005: 91).

The notion of Forest Reserves was new to Malaya, but not for other dependencies within the control of the British Empire. Similar devices in different regions of this globe for

parallel purposes, such as soil-water conservancy and timber resources supply, could be found without any difficulty. For example, the policy of forest reservation has been actively pursued for some 20 or 25 years, ever since the Gold Coast Government recognised the various dangers arising from the rapid disappearance of the forest by indiscriminate clearing for food and cocoa farms (Steel , 1948: 37-38).

The establishment of the first Forest Reserve at Mt. Hijau, a watershed between the catchments of the Perak River and its tributary- Kinta River in Larut, north-western Perak State, can be regarded as important in providing a trial for the systematic administration of the forest resources of the colony. Five years later, another fifteen Forest Reserves were constituted in seven Districts, apart from the Hijau Reserve situated in Larut District (PGG, 1896: 88-91).

The origins of forest policy in British Malaya date back to the early decades of colonialism in the late nineteenth century. A core feature of colonial forestry, for the British Empire at least, was the irrevocable link between forest protection and sustainable wood production. Multi-purpose based concept of forest reserve comes obviously from the Indian forest administration. The circular states that the objectives of which (forest reserve) may be summarised in the words of an Indian administrator as: 1. the prevention of the deterioration of the climate and the retention of moisture; 2. the husbanding of the national resources in timber and fuel for the use of the people.

The location and limit of these reservations were still not strictly defined during this starting period. For example, the boundaries of the Hijau reserve were as follows: from the Bukit Lara Trigonometrical Station in a south-easterly direction along the ridge to the Ulu of the Sungei Batu Tegoh Ulu, following the said Sungei Batu Tegoh Ulu to where it debouches on the plain, thence in a north-westerly direction following the foot of the hills to Bukit Berapit in the Batu Kurau mukim, and from Bukit Berapit to Bukit Lara. (PGG, 1891:1028)

Codifying the Forest Reserves became necessary when the numbers of proposals for Forest Reserves increased gradually. The legislative basis in 1890s by which the Forest Reserves establishment was laid was an *order in council* not the formal enactment or law. For example, the first written lawful root passed in the Perak Government was *Order in Council No.7 of 1891*. Less than one year before, the notion of Forest Reserve was just introduced into the Malay Peninsula from the Indian Continent. One circular which was dated on the 13th of August in 1890 provides much valuable information and considerable clues. In terms of the State of Perak, the Forest Reserve is a constructed land category concept which was transplanted from British India in the early 1890s and commenced to

superimpose into the Malaya forests landscape. The concept finds its origin in a aforesaid circular from F. A. Swettenham, the Resident of Perak. The Resident directs that in each district of the State the Collector and Magistrate or District Officer in charge should take steps to mark out and define the boundaries of forest reserves, selecting localities where there is the largest amount of valuable timber trees available and accessible (PGG, 1890:532).

The integrative notion, forest and land as a whole, made its initial existence, when the first Forest Enactment was released. The administration of the forests of the Malaya had been started since the very beginning of the twentieth century. However, the moment when the Forest Enactment appeared implied that forest became an integral concept, rather than an assembly which could be separated into the forest produce and the land basis as long recognised before. Before the Forest Enactments were issued, the regulating and dealing of forest matters was primarily dependent on the Jungle Produce Enactment of 1901 and the Land Enactment of 1903.

To make exploration into the distribution of forest resources and the confirmation of its values, the authority consulted local headmen, such as *Penghulus*. Instead of making much effort to conduct the fieldworks by themselves, the British administrators had chosen to borrow the hands from the individuals who were familiar with the domestic affairs. This definitely does not mean that these officers had not quite as much interest in this issue, but they were forced to rely on the assistance from experienced indigenes as the lack of required official staff. You also could observe the following remarks in the same circular:

The presence of Forest Reserves not only revealed the logic of land design and arrangement by the colonial authority but also elaborated the more concordant land management the government expected. Reservation had been convincingly rationalised in terms of the government's land development policy since the late nineteenth century. By providing an effective means of managing un-alienated land, forestry started to possess a particular position. This notion could be strongly supported by the proposal of Jeyamalar Kathirithamby-Wells. Kathirithamby-Wells, in economic views, argues that, the reason why this forest formula was found for integrating forest protection within the economic framework of the colonial state is the Forest Department in mid colonial Malaya could not compete in revenue terms with mining and plantation agriculture (Kathirithamby-Wells, 2005: 159). The remark which she cited from G. E. S. Cubitt, original Inspector of Forests in Burma and later one of the pioneer Malayan foresters, may be perhaps the best explanatory notes to approach the will of Malayan colonial administrators: '*Get blocks of land reserved, then we can sort it out later*' (ibid: 159). In addition, it is worthy of notice

that the constitution of Forest Reserves did not imply that the forested areas noticed in government gazettes would not be disposed and alienated again in the future.

The invention of Forest Reserve is essentially not only another independence of managerial land type from original frameworks but also an embedding of forest space into the existing landscape. Borrowing Reginald Cline-Cole's idea (2000), the establishment of the Forest Reserve is something similar to the definition and creation of the forest space. Compared to the categories of agricultural and mining land which could be regarded as the reconfirm of ancestral land utilisations, the forest reserve was a whole new product of colonial will. Beginning with some historical background would make it clear to know the formatting progress of forest (re)definition. The following discussion relating to the Forest Reserves in Malaya is partly inspired by the observations of Reginald Cline-Cole, in which he is interested what happened to the redefining forestry space in the colonial government's strategy in Kano, one of the provinces in Northern Nigeria (Cline-Cole, 2000: 14).

Due to the diversity of meaning of nature or environment, colonial regimes may choose to receive the conventional concepts and customs of local people on environment or reconfigure their ones some extent to fit imperial strategies and profits. Taking the experience of Northern Nigeria under British administration for example, there was fundamental dissimilarity in the notion about the sources of fuel woods between the colonial government and the local residents, as those professionals and officials whose cultural roots were in Western Europe held the belief that '*forest rather than farmland should be the chief supplier of fuel woods*' (Cline-Cole, 2000: 14).

During the early phase of its development, Malayan forestry continued under the patronage of the Burmese service. In British Malaya, the first Forest Enactment which was inspired by another British dependency on the sub-continent, Burma, was drafted and proposed in late 1904. Regarding to the origin of formal forest legislation, the Federal Secretary, F.M.S. stated clearly in a piece of correspondence to the Acting British Resident of Selangor for asking criticisms that:

[the] draft Forest Enactment which has been modeled on the lines of the Burma Forest Act of 1902, [is] with considerable omissions and modifications to meet local circumstances.

(Malaysian National Archives (hereafter MNA), 1957/0118979 5849/1904)

Malay Reservations in Peninsular Malaysia are areas demarcated for exclusive alienation to and settlement by Malays. Beginning in 1914, various tracts of land of different sizes

were gazetted as Malay Reservations from which dealings in land such as transfer of ownership, lease, and charging of land for loans were restricted to persons of the Malay race and Moslem religion (Voon, 1977: 496).

The spatial distribution of the Malay reservations is still not very clear currently, although a good many pioneering researches have invested considerable concerns about its related issues. The British took the view that the Malays were the only permanent agricultural population of the Peninsula, on who would devolve the main task of food production. Hence, the official policy of encouraging them in rice farming, and to a lesser extent vegetables, poultry, etc, and of ensuring through the Malay Reservations enactments that 'ancestral' lands should not pass under the control of non-Malays. This legislation was supplemented at times of acute depression, for example, in 1931-32, by laws to reduce the number of forced sales of smallholdings at the instance of creditors (Kratoska, 1983). This referred particularly to *kampong* (village) land which was the site of rice planting, fruit trees, houses etc. considered integral to the maintenance of settled communities of Malays, whereas *kebuns* (gardens).

CONCLUSION

This chapter explored the colonised knowledge of the environment, with special reference to land classification. The land demarcation aimed primarily to promote the development of a variety of economic industries, but did not necessarily correlate with the classification of diverse races who survived in the Peninsula. How did the colonial state possess the land? Mainly through enacting laws, a number of categories of lands were transferred to colonial governments, especially those that were not under continual cultivation. People were encouraged to make land registration. Consequently, the new lands which the state had more control on them made it especially easy for large tracts of forest to be auctioned, providing easy revenue for the administration and cheap land for speculators.

The land classification in British Malaya made its formation at the turn of the nineteenth and twentieth centuries. It emerged in the late 1890s and was patterned or typified toward the 1910s. However, the land mosaic which consisted of the mining lot, the agricultural block, the Forest reserve, and the Malay reservation was not stable but mobile. Of them, the reserved forest had seen its own growth at a considerable pace since the 1910s but also witnessed the relative stagnation in about the 1930s. During the fluctuant decades, some active contests did come from other economic modes that are mining industry and plantation sector. For example, on the one hand, in the comparatively unpopulated hills, the

forest reserves need to be prevented from the gradual invasion of intending mine owners. On the other hand, in the easily accessible lowlands, the main competition for the reservation of forests comes from the planters. Contrary to codification and spatialisation of the surviving land utilisations, namely plantation agriculture and commercial mines, both of the Forest reserve and Malay reservation were freshly created for forestry development and aboriginal peasantry.

The Revenue Survey Sheets could be seen as one of essential means to the complete control of Malaya land by the British. The importance of the use of cartographic information for effective administration in Malaya is that the land and resource not only became visible pictorially but also were possible to be measured and calculated. Under the directions of colonial will, three rough land categories of agricultural, mining and reserves areas were surveyed by responsible institutions and marked on the Revenue Survey Sheets, or the coloured land utilisation maps. Initially, only the alienated agricultural land and leased mining land were marked. Later in the mid-1890s and mid-1910s, however, the forest reserve and Malay reservation were constituted and enlisted in this sort of maps respectively. British representation of Malaya as exploitative mining and productive agricultural land find its origins at the very early period of British intervention and continue to survive until the end of her rule.

The *rational* land arrangement which was triggered by the colonial administration, whether it was devised by the intentional will or was forced to form, would be satisfied with the demand at most cases and to some extent. The land classification, by some means or other, implied that corresponding spatial extent existed too. On the one hand, the plantation and mining could probably be promoted by providing the lands they needed. On the other hand, the delineated territory as the Forest Reserve not only enhanced the revenue of government but also supplied the required timber or fuel resources while another delimited space as the Malay reservation at least guaranteed their land and subsistence rights. To be frank, of course, it was always not easy to find a harmony balance among the separate beneficial groups, who perhaps belonged to the Chinese miners, the European planters, the government foresters and the Malay peasants.

Something like the crucial point here is that the land demarcation involved working with the physical environments rather than abstract space. Thus whereas much critical cartography (such as link later) might be used to see surveying as the creation of abstract space in Lefebvre's (1991) sense where physically specific land became homogenised and commodified through cartographic equivalences, in this case, the location of different land

classifications was highly connected with the mapping of environmental ecologies. Many political-science oriented studies virtually ignore the physical environments of the peoples they study, as if the people live in thin air. This commoditisation was framed in terms of categorisations of land suitability for different uses setting the terms for competition for ecologically similar ground between the separate land uses. For example, forest reservation became one of the most extensive and significant components in the Governmental land administration. The forest reserves occupied most of the un-opened 'waste lands' in whether remote hill slopes or potentially-cultivable plain countries until the 1930s. However, over this period increasing demands from other economic activities such as mining industry and plantation sectors began to demand a re-designation of such areas as suitable to their uses.

Chapter 7 Conclusion

INTRODUCTION

The preceding chapters of this thesis attempted to put the technocrats' exercises in environmental typification in the context of the colonial sciences. The colonial states developed a series of abstract discourses and related practical techniques to mobilise the people and environment in colonies, such as condensations, displacements, detachments, rationalisations and so on. The cases from Malaya and Formosa illustrated how colonial states found ways to reorganise their colonial dependencies by transforming or abandoning traditional human-nature complexes with new political and economic frameworks. As we have shown that, even through different methods, both of the colonial Japanese and British authorities aimed to shape the environment as spatially recognised, administratively governed, and publicly merchandised. Therefore, the environmental compound of the land and resource could be abstracted or distilled into several categories for the needs of control and exploitation.

In this light, this chapter, employing a comparative perspective, furthermore seeks to feature the colonial territorialisation conducted within the Asian regions, namely the island of Taiwan which was ruled by the Japanese Empire and the Malay Peninsula which was subject to the British Crown. We are also concerned with how the colonial states, by transforming the region from wild hills and forests to land with natural bounties, defined both their power over the environment and their right to dominate the region. In accordance with the themes relating to environmental governance in my research, this chapter will focus on several fundamental issues and processes. Using a mix of primary and secondary materials on the environmental territorialisation in colonial Taiwan and Malaya, the research has sought to reconstruct the knowledge production relating to colonial environments. In the previous chapters, the so-called colonial environmental territorialisation was divided into two main parts dealing with the processes of exploration and demarcation in Taiwan and Malaya respectively. Although considerable similarities could be recognised, some variations also need to be identified.

The British and Japanese authorities encountered with different native societies and had of course their own colonial purposes and governing methods.

1. To begin with, the regions of the Malay Peninsula and the Island of Formosa shared similar colonial histories but were shaped into different landscapes. The period of late nineteenth century and early twentieth century was one of remarkable parallel developments in tropical colony-making between Japan and Britain. The parallel land

categories which refer to industrial block, forest reserve and aborigine reservation, especially attract our attention. However, these similar categories derive from different ideologies in the two imperial states.

In general, most of the areas were delineated as state-controlled forest reserve, they not only enhanced the revenue of government but also supplied the required timber or fuel resources. Another space delimited as aboriginal reservation sustained the native subsistence rights at least. Still other private-run enterprises, including plantations and mines, were granted lands for development. However, the land development of Taiwan and Malaya focused on rather different agro-sectors, forestry and plantations respectively, in the first half of twentieth century. The primary forests of mountainous Taiwan were transformed into timber bases for production and conservation, while the wild woods in British Malaya were cleared and then cultivated for cash crops. In addition, tin mines, forest reserves, and Malay reservation scattered in particular places too.

This thesis has examined the claim that difference in environmental knowledge may be the main reason leading to variations in strategy which constructed the landscape. In other words, the seemingly comparable tropical and hilly environments in the Island of Taiwan and the Malay Peninsula were read differently. Accordingly, it looked into the production of colonial environmental knowledge.

2. Indeed, there was obvious diversity in the forms of processes for gaining knowledge, but surprisingly there was still a quite similar sort of knowledge generated. That is both of the case areas had experienced the stages of exploration and demarcation as well. However, we should not overemphasise the skin-deep resemblance. Rather, the focus should be laid on the processes and the modes of environmental representation. We find that geographical/environmental establishment in British Malaya and Japanese Taiwan followed two quite different ideologies of governmentality. On the one hand, the widely held doctrine of the Japanese colonial officers was to undertake the most sweeping and perfect surveys, if possible, all round the newly annexed territory of Taiwan. On the other hand, however, the usual practice of the British imperial administrators was to undertake a partial and pragmatic survey focused on detecting and securing where the source of revenue might be located as soon as possible. Nevertheless, representation is the real point which shaped the man-land relationships. And this determines or structures the way the actors could interact with the environments or relate with each other.

Whilst this chapter certainly concerns what landscape the colonial administrators and specialists actually encountered, it is much more interested in how this landscape was represented, evaluated and finally demarcated. In terms of periodisation, my concern was

to look how differently the two imperial authorities explored, organised, and then circulated representations about the referent colonies. Actions by the colonial officers, scientific experts, and enthusiastic civilians in the early periods of colonisation usually aimed at the preparation of land acquisition and resource exploitation. This was especially so if the natural resource and land acreage was identifiable and recognisable as well as if the territorial governance was justifiable (otherwise legitimate at least). On the other hand, the chapter continues to examine the features revealed in the demarcation processes. The parallel land categories which refer to industrial block, forest reserve and aborigine reservation, especially attract our attention.

The problem to be settled here is why the distinct conducts of territorialisation process took place and what features of different colonialisms were reflected. In the following analysis of environmental territorialisation in colonial Taiwan and Malaya, I argue that the process's importance derives from its extra-scientific impact on knowledge interpretation.

To demonstrate this, the chapter firstly examines the wider economic, historical and geographical contexts. It is believed that most of the colonial authorities' ideas and actions were influenced or constrained by these wider structures. Within the framework of territorialisation, knowledge production, that is inclusive of knowing the land and demarcating the environment, was organised according to those wider imperatives. To follow this argument, the chapter secondly deals with several critical issues that are worthy of comparison. In the process of knowledge formation, I pick up two facets in relation to environmental discourse and cartographic governance, as both of them are mostly projected the colonialism possessed by two imperial powers, whether in processes and results. Environmental discourse here stresses the establishment of the land system and its subsequent fragmentation into analytical elements. Because the different visions of environments were adopted by separate colonial powers respectively, varied cartography techniques were thus applied and diverse images were seen on the maps.

In brief, this comparing and concluding chapter attempts to contribute to the burgeoning critical literature on the knowledge of environment by tracking the links between maps, knowledge and power that stemmed from forest surveys in Japanese Taiwan and land surveys in British Malaya respectively. Also this chapter concerns itself with the importance of the territorialisation processes lay on how it restructured or reconstituted the relationship between people and land as well as within people. The ways by which the colonised people were seeing, accessing, and using the lands were largely formulated through the colonialist's economic interests, social concerns, and cultural imaginary.

GEOGRAPHICAL AND HISTORICAL CONTEXT-

Japanese autarchy and British specialisation

Overall, the Japanese worried about the self-sufficiency of colony, while the British tended to professionalise its dependency. This dissimilarity was largely determined by the scale of the empires. Both of the two imperial perceptions and administrative goals dominated the way the colonies should go. Although British imperialism was extraordinary far-reaching, while Japanese colonialism was a comparatively new-comer. Different imperial states cooperated with diverse forms of sciences to achieve a variety of ruling purposes. Intentional environmental representations were created to legitimise the colonial possession or appropriation and to enable the land development, just as the subject/people governance was largely enhanced through racial classification.

Empirical methods were devised and employed differently in the two colonised regions, even though whose administrators similarly had to secure revenue in order to manage and to develop the colonies. For both of the colonial governments in Malaya and Formosa, the financial pressure was apparently felt. The Formosan Government was required to be self-sustaining at the very beginning, so that the small subsidy annually granted by the hard-pressed national treasury in Japan could be reduced to its minimum. The nationalisation of industries as well as the monopoly of commodities, therefore, became the chief colonial methods feeding the economy of the Japanese administration in Formosa. In the Malaya case, the British officials were forced to collect revenue at their best in order to maintain their governance. The establishment of a permanent land revenue system on the basis of agriculture preferring large-scale plantation to small farming was pursued. This measure not only brought with it the proliferation of European concessions (largely British) but also aimed to decrease the dependence on revenue from the Chinese miners. And this did not alter the principal policy of protecting and sustaining a stable agricultural Malay peasantry. After all, the *de facto* authority and the maximum degree of influence of the British Residents was allowed by Sultans of *independent* Malay States.

In Formosa and Malaya, colonial administrations confronted with a complex problem, for which in the main both authorities have worked out either different or similar solutions. On the one hand, the Japanese found the area of the Formosa Island about equally divided between millions of Chinese immigrants who had appropriated and tilled the fertile western lowlands, and the primeval aborigines who maintained themselves in the fastnesses of the eastern mountains. The Japanese were particularly interested in and enchanted by the forest wealth around the highland Taiwan, although the agricultural production on plain countries was considerable too. However, the head-hunting races

residing in forested mountains were usually regarded as a constant menace not only to economic development and but also to land territorialisation. On the other hand, the British were clearly aware of the human occupation and land utilisation on the Malay Peninsula. The typical landscape originally is that a range of sultanates, big or small, which were nourished by export duties largely and Malay peasants less stretched along the main rivers and valleys. Another important condition, needless to say, is that Chinese presence at the Malay Peninsula was already in progress for mining and agricultural purposes in the early years of the nineteenth century and in several regions had assumed significant proportions before the British first intervened directly in the Malay States in 1874. Dependency on cash crops, however, unfortunately meant that efforts to stimulate greater rice cultivation never kept pace with population growth. Malaya thus used revenue gained from its exports to purchase nearly half of its rice from Burma and Thailand. Indeed, throughout the 1930s Malaya was the world's largest producer of tin. Moreover, in the decade before the war, Malayan plantations supplied nearly 40 percent of the world's rubber.

Fear for the deficiency of timber supply may be one of possibilities for the Japanese anxious to promote forest management in Taiwan. As for the Japanese colonial policy, the state benefits had much higher rank than the private capitalists profits. Unlike the Western colonial powers, the imperial Japanese government had displayed the unbridled enthusiasm and played a remarkable role in promoting the development of colonies. For example, the concern of the Japanese government about the potential timber shortage was also paid to the new territory of Taiwan. The timber scarcity that had long existed in metropolitan Japan did not mean that necessary and remarkable exploitation of forest resource in colonial Taiwan. However, the authority in colonial Taiwan had worried if the shortage would happen and avoided it. Reasonable and sustainable forest management was thus commenced in the plains and highlands of Taiwan, subject to good timing. As early as the second decade of colonial administration when the Japanese imperialists began to access the 'savage districts', they were already aware of the forest wealth in interior Taiwan. Constrained by the aboriginal rivalry and inconvenient traffic, however, the export of Taiwan timber to Japan was not initiated until the 1900s. Firth, a British Consul who stationed in Tamsui, North Formosa, observed that a great quantity of timber, principally for building purpose, was imported from Japan. Firth concluded the reason that:

Although the interior of Formosa contains large forests of valuable timber, which will be available when the construction of railways into the mountains is effected, supplies are at present somewhat limited and it is cheaper to ship from Japan (Firth, 1909: 399).

In 1913 the first record could be found in timber exported valuing 10430 pounds, however, at the same time Formosa as usual imported from south China and Japan valuing 64'780 and 261'310 pounds respectively (Harrinton, 1913: 273, 276). In addition, until the early 1930s timber (mainly cedar wood from the Fukien Province of China) together with other items, such as bean cake and wheat bran, still formed the bulk of Formosa's import (in Taiwan Political and Economic Reports 1861-1960 vol.7 1932: 242).

In this sense, the Japanese authority devoted its energy at best. For example, Han-Yu Chang and Ramon H. Myers, in economic historic perspective, pointed out the similar fact, as early as in the 1960s in pioneer studies regarding the Taiwan example of Japanese colonial development (Chang and Myers, 1963: 433-449). They suggest that Japan's acquisition and development of Taiwan did not stem from the efforts of a capitalist class seeking cheaper resources and new market outlets, or engaging in dumping practices to maintain a high rate of domestic profit. Rather, Chang and Myers go on to demonstrate that, Taiwan's economic transformation was brought about by enterprising bureaucrats who formulated a policy of state action in areas unattractive to private capital in order to create conditions that would encourage and sustain private investment.

Japan had articulated itself characteristics of colonialism in the administration of Taiwan. Since Taiwan was Japan's first colony, establishing Japanese authority there became for a time the focus of debates about the principles of colonialism. There was from the start some doubt among Japanese policy-makers about which Western models it was best to follow, or even whether they were appropriate at all (Myers and Peattie, 1984). Among these references, the Japanese imperialists were chiefly interested in the colonial methods of French and British empires. The Japanese-style colonial governance featuring as autarchy or economic independence could also be found in the more newly annexed territories in the 1940s, such as Hainan Island from the China government (Jarman, 1994: 480) and Malay Peninsula from the British Empire (Schencking, 1998: 353-355). *Hainan Island ...indeed, allusions to the need for developing food production in Hainan for the requirements of 'a certain special quarter' suggest that it is Japan's intention to make of that island a self-supporting permanent military base from Canton to French Indo-China* (Kermode, 1941: 480).

The difference in the attitude toward the strategy status may be demonstrated by the Malay Peninsula under separate colonial rules of British and Japanese. Malaya which was originally governed by the British was occupied by the Japanese Royal Army in early 1942. The Japanese aimed to make Malaya, with the help of civil administrators, a self-sufficient territory within the Greater East Asia Co-Prosperity Sphere. The measure varied quietly

from the former authority which had owned many possessions in the world. The new colonial government attempted to transform one of Britain's more dependent colonies in Asia into a self-sufficient territory within the larger Japanese empire.

In conclusion, the difference between the British authority and the Japanese regime becomes clear if we comprehend that the separate roles the island of Taiwan and Malay peninsula played in their empires respectively. In the Malaya model, the centre of calculation is to organise the regional specialisation. In the Taiwan model, the centre of calculation is to achieve the colony's self-sufficiency.

ENVIRONMENTAL DISCOURSE: FROM ABORIGINAL LAND TO COLONIAL TERRITORY

The colonial environments in Malaya and Taiwan respectively were shaped in different forms of discourse. These discourses were made under dissimilar power relations. However both of the authorities had aimed to develop particular forms of the states' power over nature or land. The British centered on the commodification of land resources, while the Japanese had attempted to pursue the nationalisation of territory, then the forestry space was created. This, of course, does not imply that there was no other industrial activities had taken place there. Rather, the region was framed or constructed mainly according to specific logic, such as land demarcation in British Malaya and forest sub-division in Japanese Taiwan.

Scientific conduct was thus a strongly conscious exercise. The environmental discourse formation which belongs to a kind of scientific conduct, was influenced by colonial dominance which expressed particular purposes. It was required to display what it really investigated according to the disciplinary nature, on the one hand; it was instructed to represent what the colonial authority expected ideally on the other hand. No one may deny the thesis that culture and associated procedure of knowledge generation are subject to the dominant relations. For example, Cole Harris argues that colonialism contributed to the leading power relations stated before, in the views of post-colonial scholars (Harris, 2004: 165). Another evidence comes from Peter Vandergeest and Nancy Lee Peluso. They argue that colonial intervention into native land matters relied on the ability of colonial knowledge to re-inscribe the landscape through technologies of rule, such as creating administrative units, mapping and surveying the land, creating boundaries, writing land laws, delineating which areas could be used by whom, and creating land titles to legitimate peoples' use of the land (Vandergeest and Peluso, 1995). This way of managing information epitomized the symbiosis of knowledge and power that was the basis for

developing and ruling the territory through the colonial project.

As the main concerns of my research lie in land demarcation in British Malaya and Japanese Taiwan, the cartographic science, with special reference to surveying and mapping, inevitably becomes a crucial technique to colonial rule. As what we have seen in typical colonial landscapes, the actions of cartographers who accompanied of other experts not only shaped the compartment on the maps abstractly, but also divided the geographical structure in the land truly.

The research suggests that both of the colonial Taiwan and Malayan governments defined the environment as a cartographically manageable system. Indeed, a great many of systems or forms could the environment be described and recognised. As David Gilmartin asserts that the environment could also be conceived by colonial engineers as a mathematically modelled system. In the Indus Basin in India under the British administration, Gilmartin notes that, irrigation engineers by dominating canal construction as well as by modelling water flow, distribution and use, sought to control water and apply it to maximum areas of land. He goes on saying that in doing so, hydraulic experts defined a conception of the hydraulic environment as a system of discrete and interlocking parts, knowable (and potentially controllable) by 'objective' observers and by the state (Gilmartin, 1995: 212).

The British and Japanese governments made decision for a variety of reasons which has been supposed in the early section of this chapter, such as the Japanese long fear on potential shortage of timber supply and the British would like to secure abundant and stable revenue to underpin its administration of the Malay States.

Territorial Control or Involvement

Encountering distinct peoples with varied political relationships and substantial features on different locations, the Japanese and British regimes developed separate methods for territorial control or involvement. Whilst the British imperialists made good use of law enactment to become involved in the land planning and development. Instead, the Formosan Government embraced military actions as a critical solution to the problem of territorial dominance in Taiwan's rugged mountain interior, where most armed resistance to Japanese rule simmered well into the 1910s. The results came from different practices and processes of land appropriation mentioned above had brought a new form of territorial governance. In other words, the local Japanese administrators had absolute and supreme power to manage the highland Taiwan, while the domestic British officers were unavoidably forced to negotiate the land matters with the native rulers or foreign

entrepreneurs.

The British intervention of land in Malaya was chiefly through the encouragement of registration. Registration of landholdings, known as Torrens System, triggered the modern land administration in the Malay Peninsula in the late 1890s and became the norm of the British government to territorial involvement. The registration of titles focused on the lands under continual cultivation. People were encouraged to make land registration. Consequently, the new lands which the state had more control on them made it especially easy for large tracts of forest to be auctioned, providing easy revenue for the administration and cheap land for speculators.

The selection and adoption of a land code system reflected the British government's attitude to the Malay subjects on the Peninsula too. Of course, the colonial imaginary to the Malay-land relationships was not necessarily what they really were. The loose link between man and land in Malay society was obviously constructed by colonial British officers. By doing so, the alien British authority had an opportunity to claim possessions and to ignore the potential connection between Malays and their used land. According to Paul H. Kratoska, the British government in Malaya had two alternative modes to learn for Malayan land system. The British chose the convenient and elastic way, because the people the British encountered in Malay Peninsula were aborigines who lived in primitive society without so definite, explicit and solid landownership conceptions. Therefore, acquiring from rather the India case but the experience of Australia where the aboriginal linkage to land was also presumably underrated. As Paul H. Kratoska claims that Land laws in India had been designed to accommodate these features where had a large peasantry with long established rights in land, neither of which was characteristic of Malaya. He continues to argue that the population of the Malay Peninsula was sparse and individual ties to particular parcels of land were minimise (Kratoska, 1983: 151). Zaki and others further point out the main purpose of the colonial government. 'Land then the only asset of the country was really what the colonial government was after. The potentialities of their use and development for mining, agriculture and forest exploitations could be see no limits but the boundaries of the state' (Zaki *at al*, 2010: 35).

Fierce military measures were adopted in colonial Taiwan and thus the lands which had long been occupied by the aborigines were swiftly captured in an amazing manner. The control process may be exemplified by *Naiakohei* region in north-western highland Taiwan. *Nai-ko-hei*, lies topographically at the confluence of two tributaries of the *Tozen* River, the *Naiwan* River and the *Shohei* River. The rugged divide area is also drained by some branch creeks, such as the *Mekaran* River and the *Mehoman* River, in the slightly outer edge of

this part. Isolated river terraces stretch along the small valleys. The *Nai-ko-hei* region was originally a territory where approximately four hundred and eighty aborigines lived and cultivated, according to the record which was made in 1906 by a pioneer ethnographer, Ushinosuke Mori. Mori named the people *Mekaran group* and it actually consisted of several residential sites, such as *Maihowan*, *Wani*, *Matoe*, *Parajian*, *Arao*, *Tentana*, *Ebo*, *Yabagan*, *Takabiru*, and *Toke* (Mori, 1917: 67). The *Mekaran group* measured 100 households with about 478 persons, but these localities could not be identified as contemporary. They sustained themselves on the cultivation of dry paddy.

The closer settlement of aborigines in this area began in the 1910s. From July to September in 1909, the colonial government initiated a pacification warfare aiming to capture the heights around the Mt. *Yurasan*. The police force pushed the cordon forward along the valleys of *Naiwan* and *Shohei* respectively and this hilly area was enclosed finally. The first resettlement in *Nai-ko-hei* took place in 1910. Some tribesmen were de-armed and moved inside the guard line (Police Bureau, 1921: 145). The unsettled or disturbed state of affairs in the neighbouring districts led to co-operation between the private firm and public sectors. In 1919, for example, the *Taiwan Development & Tea Company* requested the police authority to move the barbed wire southward aiming to enclose the tribes of *Mekaran*, *Matoe*, and *Tentana*. By doing so, the tribesmen were expected to have more opportunity to acquaint themselves with the techniques for paddy cultivation. However, the TDTC finally donated ten thousand Japanese dollars to complete the work (Police Bureau, 1932: 511-512). Therefore, the control and partition of the ‘Savage Territory’ was truly an entanglement between the public departments and private capitalists, but their own opinions of the aborigines were completely ignored in this process.

Knowing the Land

Representations of ‘environment’ in colonial territories were situated within the context of purposes of British and Japanese Empires respectively. After exploring a great number of critical themes and issues, we have been truly aware of the fact that individual imperial officers of two empires did choose diverse approaches to enhance their environmental knowledge. On the Taiwan side, dispatching to the upland region of Taiwan by the Japanese central departments of the Formosa Government in the early twentieth century, the professional foresters and surveyors conducted a series of exhaustive surveys and have been represented as the ‘true displayers’ of the interior of Taiwan. I argue in what follows that the specialists helped to create a forestry space (rather than simply discovered a

pre-existing geography), and that their reconnaissance induced and supported a range of imperial and colonial practices. On the Malaya side, In a word, both of the work of forestry technocrats and government surveyors played a central role in the creation of a system of imperial inscription that primed the colonies.

The systematic identification of land or resource differed economically and politically by colonial powers. Not surprisingly, cartography which specially refers to mapping and surveying was one of the significant ruling-techniques performed in both Japanese and British colonies. The superiority of intellectual and mathematical over pictorial and sensual knowledge was commonly and consensually acknowledged by the officers and specialists in colonial Taiwan and Malaya. Therefore, most of them endeavoured to prepare and produce backbone maps for achieving or improving colonial administration. The advantage of map representation, for example, could be well demonstrated by one of Lucia Nuti's works. Nuti notes that the desire to overcome the limits and subjectivity of sense knowledge in the nineteenth century was to search for an image capable of expressing totality within the field of vision, the panoramic, all-embracing view of the divine eye (Nuti, 1999: 108). The way the two authorities varied in their attitude and performance in pace, size and form becomes the main focus here in this chapter. This chapter, of course, concerns about what landscape the explorers and surveyors actually saw, but it is much more interested in how this landscape was recorded, represented, and evaluated.

The lack of knowledge about the nature and extent of territories discouraged both the officers in the colonies. However, the two imperial regimes had chosen different modes of exploration. The Japanese was keen in forming knowledge regarding the nature, while the British seemed to be little interested in pursuing physical facts. On the one hand, although the Japanese control of highland Taiwan commenced much later than the plains, the surveying project there followed immediately after the government's aboriginal pacification, that is by the middle of first decade of twentieth century . Military-scientific expedition featured most of the surveys. Armed survey teams went through the unknown and little-explored forested areas carefully. One may imagine that if personal inspection were the only means of conducting these surveys, they would have produced very meagre results. On the other hand, the British intervention started in the mid-1870s, but institutional surveying teams were not dispatched until the late 1880s. Prior to this period, no considerable objects and results were achieved by scattered exploratory activities, owing to the lack of organised societies or government departments coordinating them. Some sporadic but pioneering expeditions, explorations, and inspections were triggered by some specific colonial officials, especially after the late 1870s when formal British

intervention commenced.

No one might imagine that there is any sort of pure and objective surveying. In other words, the intentional exploratory activities promoted or triggered by colonial government echoed neatly with the rationalisation processes which are proposed by Michel Foucault. As early as the 1970s, Foucault (1970) had noted that the order of things involve much with the discourse. Connecting to his later interest in the work of governmentality, therefore, the exploration or surveying in my research is by no means innocent, but intertwined with the will of colonial authority .

Specific intentions do exist in some of survey activities, even if the surveyors in the field or the directors at higher grade claim that there is absolutely no ulterior motive in the exercises of surveying. Not a colonial case, but an English example by Simon Rycroft and Denis Cosgrove reminds us of the implications behind the geographical information, in their study on the history of the *Land Utilisation Survey* exerted in England and its application. They find that, those separate land utilisation surveys which were undertaken by whether Dudley Stamp in interwar periods or Alice Coleman in the mid 1960s, were embedded with the complex of goals, objectives and visions. In terms of land classification issue in their surveys respectively, Stamp's emphasis lay on those productive lands which were suitable for agricultural uses, while Coleman revealed a growing interest in the environment for its own sake (Rycroft and Cosgrove, 1995: 102-103).

Aiming to govern a new land, following the logic of Foucault, the authority would develop some specific survey tools, methods and even institutions. The specific environmental discourse or explanation was enabled to be constructed by the establishment of responsible government departments. Both in Taiwan and Malaya, some offices were formed to take charge of numerous affairs. Take Japanese Taiwan for example, the *Forest Section* (林務課) (later *Forestry Section* 山林課) under the *Bureau of Productive Industries* (殖産局) controlled most of the forest-related affairs in the 'Savage Territory'. However, the officers in the *Camphor Section* (腦務課) within the *Monopoly Bureau* (專賣局) appointed for dealing with the matters for crude-camphor production in lower hills. In addition, the Police Bureau was the aborigine authority in mountainous districts. Lastly, the *Land Management Section* (地理課) which was affiliated with the *Bureau of Interior Affairs* (內務局) was responsible for specific land lease, grant, alienation etc. The provincial governments sometimes expressed comments on people and land in the 'Savage Territory', although the central departments in the Formosan Government led the environmental development there. Any connected or disputed land disposal, therefore,

involved with the government offices mentioned above. On the Malayan side, two types of government departments were formed and operated in charge of administration affairs, such as the Land office, Mining Office, and Forest Office. Another types were mainly concerned with the spatial-management organs- Survey Office, Revenue Survey Office. Based on the convenience and effectiveness to governmentality, local politics or ruling design was made up. To meet the demands said above, it is obvious that, for example, some government branches were re-portioned from the original departments, while some official offices were even newly established.

Different government departments were granted diverse power to conduct surveys. In Taiwan, the forest office comparatively was stronger for the Japanese colonial administration than the mining department, as the former was more capable in exploring the resources in highlands. The unequal development of industrial departments in colonial Taiwan was clearly demonstrated in the later period of Japanese administration. On the one hand, the Forest Section was responsible for almost all the forest and forestry surveys taken there. On the other hand, when petroleum raised demands for fuel, the Formosa Government had perforce to seek surveying assistance from the industrial bureaus in metropolis Japan. The detailed prospecting of oil fields was conducted in the late 1920s by the *Geological Survey*, under the Ministry of Commerce and Industry in Japan, rather than the *Mining Section* under the Bureau of Productive Industries in Taiwan.

Definition

The colonial definition of land often meant an operation in the separation of aborigines and natives from their field of domination in a variety of forms. There are many ways to define the newly-controlled land though, but they could be divided into two rough types, that is to create government offices or to form particular laws. Of course, they are at all times entangled with each other. On overall, however, the Japanese were inclined to run the department politics within the government, while the British was especially good at legislation.

The definition of land in highland Taiwan was completed through the lawful narratives, along with the real military control made by colonial government. As we have shown in chapter 4 where the legal status of aborigines to land was discussed and the conclusion was that they were exempted owning the land. That indirectly demonstrates the state was granted absolute power to claim and dispose unreservedly the land in the 'Savage Territory'. The aborigines were almost ignored in this framework and were treated as mere objects for disposal with the free will of authority. However, on the contrary, it is worthy of

attention that several studies overemphasise the importance of the aboriginal population in the governance of the 'Savage Territory'. They erroneously ignore the fact that knowing and controlling people eventually aimed to deal with the space or land, in my term. For example, when looking at the early discourse relating to 'Savage' and 'Savage Territory', Paul D. Barclay argues that for Goto and Takekoshi (policy-maker and commentator in the early Japanese ruling period) population was more important than space; from their centre of calculation in Tokyo, bio-political considerations doomed the ethnologist's vindicationist rhetoric to the dustbin of history (Barclay, 2007: 81). He ignores the critical fact that the final attempt of colonial government was to control and to arrange the land and resource, rather than just to govern the people there. Many evidences from colonial engineers and technical officers especially support this argument. For example, Juro Tsurunaga (鶴長 壽朗), a hydraulic engineer interested in the issue of conservancy in Taiwan, suggested that the aboriginal people who had long lived in interior highland should be relocated to the lower piedmonts and be instructed in the sedentary agriculture. This action not only secured the aboriginal subsistence but also achieved the forest conservancy (Tsurunaga, 1935: 20-23). Tsurunaga's argument implied the colonial authority's emphasis on land, especially its environmental services, rather than people.

Based on the notion of 'all lands are owned by State', land in the Malay States become legally useable only after it is alienated or reserved through the registration procedures. However, the land on the Malay Peninsula is substantially state-owned. Land was given to people (with limited rights and interests) for utilisation. The specific relations, which reflected the colonial British definition to land accessibility, between State and people was also noticed by a academic lawyer⁴⁸, S. Y. David Wong, in the mid 1970s. Wong indicates clearly that in the Malay States, private landownership, under the (land) Code, is without exception derived from some kind of a grant from the State. He continues to state that there exists, therefore, as between the State and private landowners, a real tenurial relationship which, granted certain qualifications, may be likened to that of landlord and tenant (Wong, 1975: 2).

The land discourse relating to Malaya was based on British intentional interpretation of Malay customary law. The lack of Malays' interests in land could be demonstrated by one of Frank Swettenham's personal but interesting observations. Excepting the descriptive statement, Swettenham expressed his attempts on the commodification of lands too. Swettenham was an experiential colonial administrator in protected Malay States and

⁴⁸ Wong called himself like this (Wong, 1975: VII).

Straits Settlements, ranging from a cadet in 1871 to the High Commissioner for the Malay States and Governor of the Straits Settlements in 1901. He said that ‘Indeed, the Malays, especially in Perak, strongly objected to the payment of any rent on that ground, and it took some time to convince them that they would be great gainers by being put in possession of an indefeasible, easily saleable and transferable title, in return for an almost nominal quit rent’ (Swettenham, 1920: 236).

An evidence comes from a piece of archive relating the amendment of ‘the Forest Enactment, 1918’ (Sel. Sec. 3367/ 1924). Although the action aimed to determine who would be mainly responsible for the forestry affairs (the candidates were State Residents, State Council or Chief Secretary to Government), the principles that should respect the Malay customary laws were reasserted frequently. One of the most critical and conflicting debates was that if the approval of the State Council should be required, when dealing with the creation and revocation of reserves. Some officers said yes, but others rejected this. However, both of the British administrators were informed that the Malay rulers were inevitably members of the Council and it was impossible to ignore these chiefs’ views. A consensus was eventually reached among the British Residents in a conference, held in late February 1925. An extract from its minutes stated that:

It was the opinion of the Conference that care should be taken in all legislation of the Federal Council to avoid any appearance of defining or delimiting the powers of the Rulers, or of the State Council.

The section 7 of the Enactment 11, 1911 was also presented again for review. The description above definitely was indicative of the should-not-be offensive or unchallengeable Malay territory, but more important was that it implied their ignorance of other areas, the British thus boldly claimed the governing rights to the lands:

The entire property in and control of all rivers, streams, and water-courses is and shall be vested solely in the Ruler of the States, but so that, in the case of lands held by a Government Department under grant or lease, or as a reserve, such control may be exercised by the Head of the Department, under the direction of the Chief Secretary in the case of a Federal Department, and of the Resident in other cases.

It seems any description of any native custom could hardly be free from a foreign ‘translation’ of the native customary norms. The British colonial government saw the preferred territorial occupation which was made by Malay people as an opportunity to make its land appropriation reasonable. The British authority not only became aware of the

exact ruling extent of Malay chiefs, but also attempted to claim firmly that what parts of territory the colonial government could govern lawfully. This certainly provided a good opportunity to develop discourses which intertwined both the original customary laws and the colonial wills to intervene in land affairs.

CARTOGRAPHIC GOVERNANCE

The importance of the use of cartographic information for effective administration in Malaya and Taiwan is that the land and resource not only became visible pictorially but also were possible to be measured and calculated. Map and its associated cartographic literacy thus began to play a critical role in colonial governance of environment, such as the geographical surveillance of people, the collection of land revenue, and the planning of land utilisation. The author here suggests that the environmental territorialisation not just involves an assertion of colonial government sovereignty but also concerns about the interpretation and representation of physical geography. Representation developed in different directions from the Japanese Taiwan to British Malaya. I shall focus here on the role that surveyor played in rendering the colonial environments visible and above all recognizable for the department officers, technical staff, and industrial adventures in colonies, for it was their work which helped to shape the colonial 'geography of environment'. In terms of representation mode, the Japanese authority preferred topographic maps, while the British counterpart was satisfied with cursory maps lacking detailed elevation information. Each served to its own purposes. This reflects how administrative demand and industrial strategy interact in the cartographical construction of a colonialisised environmental taxonomy.

The application of cartography has at all times both of the imaginary demands and practical purposes. The reason why cartographic science played a critical role in the administration system, in terms of nation states, has been discussed by Mike Crang. He suggests that the action of mapping is performative of the nation state in two ways. More than simply recording the territory, it first creates a territorialized imaginary that we now take for granted where the nation is defined by its extent. Second, it offers a technology of governance (Crang, 2009: 252). In addition, the readers might be interested in the shape of lands on the different maps, such as geometrical pattern with straight boundary lines or bounded-areas defined by rivers or ridges. It partly projects the logic of territorial definition and demarcation.

Conceiving the outer world by scientific means became reasonable and feasible. Sooner or later, the colonial officers who belonged to two empires became aware of the

importance of cartography, otherwise at least maps, and were used to utilise this pictorial creation to facilitate the governance. In general, the intellectuals and officers during the colonial period generally held the ideology that successful colonial rule could be achieved through scientific methods and thus colonial territories could be recognised in the same way.

The embedded ideology which the colonisers had at that time may be termed as ‘cartographic governance’. The term was designed to capture my sense that the colonial government tended to govern its territory by utilising cartographic ideas and techniques. Cartographic governance is best comprehended in the notion developed by Tien-Fu Shih, a renowned geographer who has contributed a great of masterpieces in Taiwan historical research. Through several empirical investigations, Shih putatively concluded that the Japanese imperialism which was imposed in Taiwan featured as ‘*Governing the land by maps, then the people on which were governed*’ (以圖統地、以地統人) (Shih, 2000: 13; 2001: 4).

This section will look at how the provincial administration- level practice was carried out within a broad policy framework that refers to cartographic governance. The differed practices requested for varied assistance of cartography and therefore created different forms of administration maps, inclusive of cadastral map and topographic map. The official attitude towards the map-aid-measure is perhaps represented in the practical conducts in different colonial territories. Both of the Malay and Taiwan cases support the notion that the cartographic literacy became an accepted and necessary part of the capabilities of colonial local administrators. Therefore, the main focus will be laid on the forms of administration backbone maps and its utilisation.

In fundamentally varied ways, colonial interests and benefits contributed to specific types of maps for official use. In accordance with varied administrative purposes, the British and Japanese authorities compiled different forms of accurate map or backbone map, namely the Revenue Survey sheets in Malaya and the ‘Savage Territory Topographic sheets’ (蕃地地形圖) in Taiwan. The Revenue Survey sheets (thence RS sheets) which were constituted from a series of large scale maps were one of most comprehensive and significant tools for the British colonists in collecting revenue and managing lands, such as mining pits, agriculture lots, forest reserves and Malay reservations. On the contrary, local administrators and technical officers in Japanese Taiwan fortunately were able to access the ‘Savage Territory Topographic sheets’ (hereafter STT sheets) with topographical details and human landscape when practicing their responsible affairs.

It is a pity that a search of policy statements or directives to professional surveyors on

the subject of Malayan RS sheets and Taiwan STT sheets, has not achieved much success.⁴⁹ The earliest instruction to surveyors in Taiwan about map making perhaps takes the form of a general directive about the documentation of field works. This indicated that the surveyors should record physical features, such as, as well as aborigine tribes.

The use of cartographic literacy can be found everywhere. A fine example in colonial Taiwan is that each of the sheets had been illustrated to locate specific area boundaries whilst the energetic industrialists attempted to make an application for a particular concession. In British Malaya, a scale of four mile to one inch or eight mile to one inch was found to be detailed enough for most practical purposes. The wide use of undeveloped manuscript maps for utilitarian purposes was not idiosyncratic among the British colonial territories. The Colonial Survey Committee of British Empire noted in the early twentieth century that *'the Anglo-Egyptian Sudan was not unique in the initial construction of rudimentary manuscript maps for utilitarian purposes. Civil and military officers in other African territories drew maps in the course of their work in the field'* (cited in Stone, 1982: 105).

It is impossible to indicate of all the uses maps, but they were essentially capable to position the physical and human features. For example, through consulting the administration sheets we could know where the district boundary is, where the principal settlement is, what obstacles in the way of rivers, lakes or mountains, the position of roads, the location of forested areas and so on. In addition, the RS sheets were kept to be helpful in clarifying the delimitations between the land lots and thus in resolving a dispute between land owners. The STT sheets failed to and had no need to consider the precise boundaries between blocks. This is partly for its scale is so small that users could not specify the dividing lines and partly for almost the highland lands in Taiwan were state-owned, though very few private possessions did exist there.

But more important, the RS and STT sheets helped to detach the native culture from the land where they had long lived and even to erase the customary territory where they ever controlled.

By nomenclature and plotting, it seemed that the aboriginal tribes could be clearly located. However, the locations which the map surveyors and makers recorded were usually the impermanent spots and in fact the aborigines who resided there would search for another places to live if overpopulated. The sort of tribal cases could be found almost everywhere. For example, according to their oral history, the aboriginal families living in had come to this current site no more than three generations. Another evidence is that there

⁴⁹ Unfortunately, no direct evidence was found.

existed a few tribe's 'refuges' (避難地). The locations of refuges were perhaps not recognised. For colonial authorities, therefore, 'refuges' meant the only aboriginal residency at present and it was also implied that at present they did not occupy places other than 'refuges'. Through the techniques of mapping and recording, the residing extent of aboriginal population was compressed into smaller space, that is from wider living ranges to specific tribal sites.

The importance of the territorialisation processes lays on how it restructured or reconstituted the relationship between people and land as well as within people. The ways by which the colonised people were seeing, accessing, and using the lands were largely formulated through the colonialist's economic interests, social concerns, and cultural imaginary. Through the territorialisation processes, the Japanese and British powers not only claimed successfully their possessions in the colonies of highland Taiwan and the Malay Peninsula respectively, but also governed systematically the environment and people on there. The territorialisation processes began with the varied forms of land control or involvement, such as forced occupation in Taiwan and peaceful negotiation in Malaya, and ended the establishment of a comprehensive land administration, inclusive of creating offices and enacting laws. In the whole processes, the Japanese authorities expressed active and radical attitudes and actions, while the British governments featured in comparatively passive and gentle manners.

Dual land administration was adopted in both of Japanese Taiwan and British Malaya, although there were still some variations. Essentially and logically, most of the lands were kept under the control of state, namely State Land. The state owned absolute priority to dispose of them. In practice, whether in the forms of the Japanese direct occupation or the British indirect rule, both of the colonial governments devised technically the 'usufructuary' for civilian use.

Unintentionally, the application of land usufructuary in both of the colonies usually correlated with particular groups of people. On the one hand, alien investors and industrialists at all times were relatively easy to access the lawful occupation, such as the land grant and lease. However, admitting legal rights to land did not guarantee awarding its title or ownership. On the other hand, the native aborigines often acquired special level of means to settle in localities. The Taiwan aborigines' residential areas clustered into specific-designed 'Savage Reserve' which was essentially quasi-reserved forest. That means the land was temporarily kept up for particular purposes, such as for aboriginal survival, and sometime in the future would be disposed of other uses, if necessary. For

example, a group of aborigines resided originally in upper Takusui River, central Taiwan were forced to escape to the site in another valley where far away, whilst a reservoir work was constructed there. In other forms, Malay people were first permitted with respect to occupy rural lands with small acreage as well as to keep their customary privileges in most of protected Malay States, but eventually encouraged to relocate in some defined areas known as Malay Reservations.

The colonial ideology of usufructuary above was further strengthened through the establishment of aboriginal reserves. Similar categories of aboriginal reserve in highland Taiwan and rural Malaya were actually designed and formed quite differently, although they still had common nature. Both of the colonial governments in two regions pursued a situation of closer settlement of aboriginal population, aiming to leave the remnant places empty. This not only minimised the spatial extent of aboriginal people for action and survival but also maximised the operating areas by capital industrialists and state authorities. However, they depended on differential ideals and practices, according to respective social, economic and cultural circumstances. These were undoubtedly reflected in the selection of reserved sites or location. We recognise that the suitable reservation areas were usually allotted to potential paddy land, if no other possible land utilisation overlapped. As a result, the individual aboriginal reserves found homes on lowlands stretching along some rivers and coastlines in Malaya, while Taiwan reservation were located at river terraces and lifting ledges scattered in lower hills and piedmonts. In addition, it is worthy of attention that the conduct of native relocation was economic-induced in the Malay Reservation, while the forced resettlement of Taiwan aborigines was facilitated by governmental authority represented by the police force.

The sort of environmental territorialisation which was highly related with specific human groups may in part echo David Gilmartin's claim that human communities shaped natural environments to some extent and in part reflect some of the concerns of political ecologists that the politics determines who and how to access the land or resources. On the one hand, Gilmartin argues that 'As natural orders defined in relationship to particular human communities, environments exist only insofar as human communities are defined' (Gilmartin, 1995: 210). On the other hand, evidence from Richard D. Tucker's research (1988) indicates that in political the ecological perspective how environments become resources as the object of discussion in colonial public sphere. In this vein, Tucker suggests that British colonial rule in India could be seen as an elaborate system of resource extraction and allocation, determining which people could derive benefit from the system and consequently shaping the appearance of the landscape.

If the articulation of land system in colonial Taiwan and Malaya were regarded as two of many experiments in territorialisation, we must say some of the success were realised and some of the tensions of course were invoked.

BIBLIOGRAPHY

General (Books and Articles)

- Allen, Herbert J. 1877, Notes of a Journey Through Formosa from Tamsui to Taiwanfu, *Proceedings of the Royal Geographical Society of London*, 21(4): 258-266.
- Adas, Michael 1989, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*, Ithaca: Cornell University Press.
- Anderson, Benedict R. O'G. 1991, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London; New York: Verso.
- Anderson, Kay 1994, Culture and Nature at the Adelaide Zoo: at the Frontiers of 'Human' Geography, *Transactions of the Institute of British Geographers*, 20: 275-294.
- Anderson, Warwick H. 2009, From Subjugated Knowledge to Conjugated Subjects: Science and Globalisation, or Postcolonial Studies of Science? *Postcolonial Studies*, 12(4): 389-400.
- Arnold, David 2006, *The Tropics and the Travelling Gaze: India, Landscape, and Science, 1800-1856*. Seattle and London: University of Washington Press.
- Azebu, Sadakuma (安詮院 貞熊) 1923, The Transition of Forests in Taiwan (臺灣森林の變遷), *Transactions of Taiwan Forester Association (臺灣山林會報)*, 2: 8-17.
- Band, Edward 1948, *Working His Purpose Out: The History of the English Presbyterian Mission 1847-1947*. Originally published by London: Presbyterian Church of England and reprinted by Chheng Wen Publishing Company, Taipei, 1972.
- Barber, Peter 1992, England II: Monarchs, Ministers, and Maps, 1550-1625, in David Buisseret ed. 1992, *Monarchs, Ministers, and Maps: the Emergence of Cartography as a Tool of Government in Early Modern Europe*, Chicago: University of Chicago Press. 57-98.
- Barclay, Paul D. 2007, Contending Centres of Calculation in Colonial Taiwan, *Humanities Research*, 14(1) : 67-84.
- Barlow, H.S. 1995, *Swettenham*, Kuala Lumpur: Southdene Sdn. Bhd..
- Barrow, Ian J. 2008, *Surveying and Mapping In Colonial Sri Lanka (1800 - 1900)*, New Delhi: Oxford University Press.
- Bax, Bonham Ward 1875, *The Eastern Seas: Being A Narrative of the Voyage of H. M. S. "Dwarf" in China, Japan and Formosa*, London: John Murray.
- Beazeley, Michael 1885, Notes of an Overland Journey Through the Southern Part of Formosa, from Takow to the South Cape, in 1875, with an Introductory Sketch of the Island, *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, New Monthly Series, 7(1): 1-23.
- Begum, Bashiran and Mohamad, Nor Asiah 2009, Labuan: Its Legal History and Land Tenure System, *Journal of Malaysian Branch of Royal Asiatic Society*, 82(1): 17-54.
- Bishop, Isabella L. Bird 1883, *The Golden Chersonese And The Way Thither*. New York: G. P. Putnam's Sons.
- Blaikie, Piers and Brookfield, Harold 1987, *Land Degradation and Society*, London: Methuen.
- Blaikie, Piers and Muldavin, J.S.S. 2004, Upstream, Downstream, China, India: The politics of environment in the Himalayan Region, *Annals of the Association of American Geographers* 94 (3): 520-548.
- Blaikie, Piers 2008, Epilogue: Towards a Future for Political Ecology that works, *Geoforum*, 39: 765-772.
- Braun, Bruce and Castree, Noel 1998, Introduction to Actors, Networks and the Politics of Hybridity, in Bruce Braun and Noel Castree ed. 1998, *Remaking Reality: Nature at the*

- Millennium*, 169-172.
- Braun, Bruce 2000, Producing Vertical Territory: Geology and Governmentality in Late Victorian Canada, *Ecumene*, 7(7): 7-46.
- Briggs, C.L. and Ness, J.R. ed. 1987, *Land, water, and culture: new perspectives on Hispanic land grants*, Albuquerque: University of New Mexico.
- Bryant, Raymond L. 1996, Romancing Colonial Forestry: the Discourse of 'Forestry as Progress' in British Burma, *The Geographical Journal*, 162(2): 169-178.
- 2001, Political Ecology: a Critical Agenda for Change? 151-169, in Noel Castree and Bruce Braun ed., *Social Nature: Theory, Practice, and Politics*, Malden, Mass.; Oxford: Blackwell Publishers.
- Bryant, R., and Goodman, M. K. 2008, A pioneering reputation: Assessing Piers Blaikie's contributions to political ecology, *Geoforum*, 39 (2): 708-715.
- Bullock, T. L. 1873, Report of a Journey into the Interior of Formosa Made by Acting Assistant Bullock, in Company with the Rev. W. Campbell, of the English Presbyterian Mission, and Mr. Steere, Collector in Natural History for the State Museum of Michigan, United States, October and November, 1873. in Robert L. Jarman ed. *Taiwan: Political and Economic Reports, 1861-1960*, vol. 1, 392-400.
- 1877, A Trip into the Interior of Formosa, *Proceedings of the Royal Geographical Society of London*, 21(4): 266-272.
- Burns, P. L. 1965, Introduction to English Language Sources in the Federation of Malaya, in Tregonning, K.G. ed. *Malaysian Historical Sources*, Singapore: Malaysia Publications Ltd.
- Campbell, Rev. William 1889, *An Account of Missionary Success in the Island of Formosa*. London: Trübner & Co.
- 1896, The island of Formosa: Its past and future, *Scottish Geographical Magazine*, 12(8): 385-399.
- Castree, Noel 2002, False antitheses? Marxism, nature and actor-networks, *Antipode* 34(1): 111-146.
- Çelik, Zeynep 2004, Framing the Colony: Houses of Algeria Photographed, *Art History*, 27(4): 616-626.
- Chang, Han-Yu and Myers, Ramon H. 1963, Japanese Colonial Development Policy in Taiwan, 1895-1906: A Case of Bureaucratic Entrepreneurship, *The Journal of Asian Studies*, 22(4): 433-449.
- Chang, Y.T.F. (張譽騰) 1994, The Outline of Robert Swinhoe's Natural Historical Survey in Taiwan and the Associated Materials, *Taiwan Historical Research* 〈臺灣史研究〉 1(1): 132-151.
- Clayton, Daniel 2000, On the Colonial Genealogy of George Vancouver's Chart of the North-West Coast of North America, *Ecumene*, 7 (4): 371-401.
- Clifford, Hugh 1897, A Journey through the Malay States of Trengganu and Kelantan, *The Geographical Journal*, 9(1): 1-37.
- Cline-Cole, Reginald and Madge, C. ed. 2000, *Contesting Forestry in West Africa*, Ashgate Publishers, Aldershot, UK and Burlington, USA
- Cohn, Bernard 2008 the Census, Social Structure and Objectification in South Asia, in Dipesh Chakrabarty ed. *An Anthropologist among the Historians and other essays*, *the Bernard Cohn Omnibus*. New Delhi: Oxford University Press.
- Collingwood, Cuthbert 1866 – 1867, A Boat Journey across the Northern End of Formosa, from Tam-suy, on the West, to Kee-lung, on the East; With Notices of Hoo-wei, Mangka, and Kelung, *Proceedings of the Royal Geographical Society of London*, 11(4): 167-173.
- Col. R. H. Vetch C.B. 1905, ed. *Life of Sir Andrew Clarke*, London: John Murray.

- Corner, Arthur 1874 - 1875, Journey in the Interior of Formosa, *Proceedings of the Royal Geographical Society of London*, 19(7): 515-517.
- 1877-1878, A Tour Through Formosa, from South to North, *Proceedings of the Royal Geographical Society of London*, 22(1): 53-63.
- Cowan, C. D. 1950, Early Penang and the rise of Singapore 1805-1832: documents from the manuscript records of the East India Company, *Journal of the Malayan Branch of the Royal Asiatic Society* 23(2): .
- Crampton, Jeremy & Elden, Stuart ed. 2007, *Space, Knowledge and Power: Foucault and Geography*, Aldershot: Ashgate.
- Crang, Michael 1998, *Cultural Geography*, London: Routledge.
- 2009, Spaces in Theory, Spaces in History and Spatial Historiographies, in Beat Kümin ed. *Political Space in Pre-industrial Europe*, 249-266. Ashgate: Surrey Publishing Limited.
- D'Almeida, W. Barrington 1876, Geography of Perak and Salangore, and a Brief Sketch of Some of the Adjacent Malay States, *Journal of the Royal Geographical Society of London*, 46: 357-380.
- Daly, Dominick Daniel 1882, Surveys and Explorations in the Native States of the Malayan Peninsula, 1875-82, *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, New Monthly Series, 4(7): 393-412.
- Delaney, David 2005, *Territory: a Short Introduction*, Malden, Mass.: Blackwell Publishing.
- Demeritt, David 2001, Scientific Forest Conservation and the Statistical Picturing of Nature's Limits in the Progressive-era United States, *Environment and Planning D: Society and Space*, 19(4): 431 - 459.
- 2002, What is the 'Social Construction of Nature'? A Typology and Sympathetic Critique, *Progress in Human Geography*, 26(6): 767-790.
- Dennys, Nicholas Belfield 1880, A Contribution to Malayan Bibliography, *Journal of the Straits Branch of the Royal Asiatic Society*, 5: 69-123.
- Dew, A.T. 1891, The fishing industry of Krian and Kurau, Perak, *Journal of the Straits Branch of the Royal Asiatic Society*, 23: 95-122.
- Dobby, E. H. G. 1942, Settlement Patterns in Malaya, *Geographical Review*, 32(2): 211-232.
- Dodd, John 1882, Probable Origin of the Hill Tribes of Formosa', *Journal of the Straits Branch of the Royal Asiatic Society*, 9: 69-84.
- 1895, Formosa, *Scottish Geographical Magazine*, 11: 11, 553-570.
- Doolittle, Amity A. 2001, From Village Land to "Native Reserve": Changes in Property Rights in Sabah, Malaysia, 1950- 1996, *Human Ecology*, 29(1): 69-98.
- Doyle, Patrick 1879, *Tin Mining in Larut*. London: E. and F. N. Spon.
- Drabble, John H. 1972, Investment in the Rubber Industry in Malaya C. 1900-1922, *Journal of Southeast Asian Studies*, 3(2): 247-261.
- 1973, *Rubber in Malaya, 1876-1922: the Genesis of the Industry*. Kuala Lumpur; London: Oxford University Press.
- 2000, *An Economic History of Malaysia, c. 1800-1990: the Transition to Modern Economic Growth*, Basingstoke: Macmillan Press; New York: St. Martin's Press.
- Drayton, Richard Harry 2000, *Nature's Government: Science, Imperial Britain, and the 'Improvement' of the World*, New Haven: Yale University Press.
- Driver, Felix 2001, *Geography Militant: Cultures of Exploration and Empire*, Oxford: Blackwells.
- Driver, Felix and Jones, Lowri 2009, *Hidden Histories of Exploration*. Royal Holloway, University of London.

- Editor, 1895, On a Taiwan trip of Yokoyama Sojiro 〈横山氏の臺灣行〉, *The Journal of Geography*, 7(78): 333-334.
- Editor, 1943 Radical Change and Its History of Taiwan Mineralogy Rule (臺灣鑛業規則の劃期的改正と其の沿革), *Transactions of Taiwanese Miners Association* 〈臺灣鑛業會報〉, 213:1-4.
- Editorial, 1942, Mindanao and Malaya, *Geographical Review*, 32(2): 179.
- Edney, Matthew H. 1997, *Mapping an Empire: the Geographical Construction of British India, 1765-1843*, Chicago: University of Chicago Press.
- 2009, The Irony of Imperial Mapping, in James R. Akerman ed., *The Imperial Map: Cartography and the Mastery of Empire*, Chicago: University of Chicago Press.
- Endfield, Georgina H. and Nash, David J. 2002, Missionaries and Morals: Climatic Discourse in Nineteenth-Century Central Southern Africa, *Annals of the Association of American Geographers*, 92(4): 727-742.
- Fan, Fa-Ti 2004, *British Naturalists in Qing China: Science, Empire, and Cultural Encounter*, Cambridge: Mass.
- Fine, B. 2005, From Actor-Network Theory to Political Economy, *Capitalism, Nature, Socialism* 16(4):91-108.
- Foucault, Michel 1970, *The Order of Things: an Archaeology of the Human Science*, London: Tavistock.
- 1980, (Gordon, Colin ed.), *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*. New York: Pantheon Books.
- 2000, *Power / Michel Foucault*, James D. Faubion ed. translated by Robert Hurley and others, New York: New Press.
- Freeman, Donald B. 1999, Hill Stations or Horticulture? Conflicting Imperial Visions of the Cameron Highlands, Malaysia, *Journal of Historical Geography*, 25(1): 17–35.
- Fujii, Shizue (藤井 志津枝) 1997, *The Aborigine Policy of the Taiwan Government-general in the Period of Japanese Dominance, 1895-1915* (理蕃: 日本治理台灣的計策 1895-1915). Taipei: Wen-Yin-Tong.
- Giard, Luce 1991, Epilogue: Michel de Certeau's Heterology and the New World. *Representations*, 33, 212-221.
- Gilmartin, David 1994, Scientific Empire and Imperial Science: Colonialism and Irrigation Technology in the Indus Basin, *The Journal of Asian Studies*, 53(4): 1127-1149.
- 1995, Models of the Hydraulic Environment: Colonial Irrigation, State Power and Community in the Indus Basin, in David Arnold and Ram Guha, eds., *Nature, Culture and Imperialism: Essays on the Environmental History of South Asia*. Delhi: Oxford University Press, 210-236.
- 1999, The Irrigating Public: The State and Local Management in Colonial Irrigation, in Stig Toft Madsen ed. *State, Society and the Environment in South Asia*, Richmond, Surrey: Curzon.
- 2003, Water and Waste: Nature, Productivity and Colonialism in the Indus Basin, *Economic and Political Weekly*, 38(48): 5057-5065.
- Goh, P. S. Daniel 2007, States of Ethnography: Colonialism, Resistance, and Cultural Transcription in Malaya and the Philippines, 1890s-1930s, *Comparative Studies in Society and History*, 49(1): 109-144.
- Gregory, Derek 2001, (Post) Colonialism and the Production of Nature, in Noel Castree and Bruce Braun ed., *Social Nature: Theory, Practice, and Politics*, Malden, Mass.; Oxford: Blackwell Publishers.

- Gordon, 1849, Observations on Coal in the N. E. Part of the Island of Formosa, *Journal of the Royal Geographical Society of London* 19: 22-25.
- Hall, Philip B. 1987, Robert Swinhoe (1836-1877), FRS, FZS, FRGS: A Victorian Naturalist in Treaty Port China, *The Geographical Journal* 153(1): 37-47.
- Hancock, William 1885, A Visit to the Savages of Formosa, *Good Words*, 373-379.
- Harris, Cole 2004, How Did Colonialism Dispossess? Comments from an Edge of Empire, *Annals of the Association of American Geographers*, 94(1): 165-182.
- Harrison, Mark 1994, *Public Health in British India –Anglo-Indian Preventive Medicine*. Cambridge: Cambridge University.
- 2004, *Disease and the Modern World- 1500 to the Present Day*, Cambridge: Polity.
- 2005, Science and the British Empire, *ISIS* 96 (1), 56-63
- Heffernan, Michael 1994, The Science of Empire: The French Geographical Movement and the Forms of French Imperialism, 1870-1920, in Godlewska, Anne & Smith, Neil *Geography and Empire*. Oxford ; Cambridge, Mass: Blackwells.
- Heussler, Robert 1981, *British Rule in Malaya: the Malayan Civil Service and its Predecessors, 1867-1942*. Westport, Conn. : Greenwood Press.
- Hoffman, Katherine E. 2008, Purity and Contamination: Language Ideologies in French Colonial Native Policy in Morocco, *Comparative Studies in Society and History*, 50(3): 724-752.
- Honda, Seiroku (本多静六) 1901, *The Forest Zones in Japan* 〈日本森林植物帯論〉Tokyo.
- Hughes, T. F. 1871 – 1872, Visit to Tok-e-Tok, Chief of the Eighteen Tribes, Southern Formosa, *Proceedings of the Royal Geographical Society of London*, 16(3): 265-271.
- Ichikawa, Yuichi (市川 雄一) 1925, The Geological Survey Progress in Taiwan and Urgent Demand for the Establishment of the Geological Survey (臺灣に於ける地質調査事業と地質調査所設置の急務), *Transactions of Taiwan Miner Association*, 121: 20-32.
- Imbault-Huart, Camille 1893, *L'île Formose: Histoire et description*, Paris: Ernest Leroux.
- Innes, J.R. 1914, Registration of Title in the Federated Malay States, *Journal of the Society of Comparative Legislation*, new series, 14(2): 386-389.
- Inoue, Kinoshige (井上禧之助) 1902, The History of Geological Survey in Taiwan, with One Journal of Trans-Taiwan Journey 〈臺灣の地質調査 & 臺灣分水嶺横斷日誌〉, *The Journal of Geography* 〈地學雜誌〉 14(7):448-458.
- Ishii, Miyasaburo(石井 宮三郎) 1896, *New Taiwan Gazetteer* (臺灣新地誌), Tokyo: Tamema Press (東京: 田沼書店).
- Ito, Tayemon (伊藤 太右衛門)
- 1913, Forest Reserve and Flood Prevention (保安林與治水), *The Formosan Agricultural Review* (臺灣農事報), 76: 10-14.
- 1923, The True Forest Condition in Tamsui Valley (淡水河流域に於ける森林分布の實相), *Transactions of Taiwan Forester Association* (臺灣山林會報), 37-43.
- 1928, Measurement of Chuko R. Discharge (中港溪流量測定の結果に就て), *Transactions of Taiwan Forester Association*, 29: 14-21.
- 1929, *Taiwan Forestry History* (臺灣林業史), Taihoku: The Bureau of Productive Industry, the Formosan Government (臺北:臺灣總督府殖産局).
- 1932a, The Policy on Conservancy of Forest and River(治山治水に關する對策), *Transactions of Taiwan Forester Association*, 69: 63-66.
- 1932b, Effect of Forests on Water Conservation (水源涵養に 對する 森林の效果), *Taiwan Hydraulics* (臺灣の水利), 2(3): 269-273.

- 1933, Forest and Water as well as the Tozen R.(森林と水竝に頭前溪に就て)
Transactions of Taiwan Forester Association.
- 1934a, Forest and Water as well as the Goryo R. (森林と水竝に後龍溪に就て),
Transactions of Taiwan Forester Association.
- 1934b, Forest Functioned as the Water Adjuster (森林の渴水及洪水に對する機能),
Taiwan Hydraulics, 4(1): 31-37.
- Jackson, James C. 1968, *Planters and Speculators: Chinese and European Agricultural Enterprise in Malaya, 1786-1921*. Kuala Lumpur: University of Malaya Press.
- Jackson, N. R. 1963, Changing Patterns of Employment in Malayan Tin Mining, *Journal of Southeast Asian History*, 4(2): 105-116.
- Jarman, Robert L. ed. 1994, *Japan & Dependencies: Political & Economic Reports, 1906-1960*, Archive Editions, v. 10. *Formosa: Political and Economic Reports 1927-1941*.
- Ka, Chih-Ming (柯志明)
- 2001, *The Aborigine Landlord: Ethnic Politics and Aborigine Land Rights in Qing Taiwan* (番頭家：清代臺灣族群政治與熟番地權). Taipei: Institute of Sociology, Academia Sinica (臺北：中央研究院社會學研究所).
- 2003, *The Contradictory Relationship between Rice and Sugar: Development and Dependency in Colonial Taiwan, 1895-1945*, (米糖相剋—日本殖民主義下臺灣的發展與從屬). Taipei: Chhun-Hsue (群學).
- Kada, Naoji (賀田 直治) 1909, Forests in Taiwan (臺灣の森林), *Transactions of Japanese Forester Association* (大日本山林會報), 314: 70-74.
- Kathirithamby-Wells, Jeyamalar 2005, *Nature and Nation: Forests and Development in Peninsular Malaysia*, Honolulu: University of Hawaii Press.
- Kaur, A. 1990, Hewers and Haulers: A History of Coal Miners and Coal Mining in Malaya, *Modern Asian Studies*, 24(1): 75-113.
- Khoo, Kay Kim 1972, *The Western Malay States, 1850-73: the Effects of Commercial Development on Malay Politics*, Kuala Lumpur; New York, Oxford University Press.
- Kopsch, Henry 1869 -1870, Notes on the Rivers in Northern Formosa, *Proceedings of the Royal Geographical Society of London*, 14(1): 79-83.
- Kratoska, Paul H. 1983, "Ends That We Cannot Foresee": Malay Reservations in British Malaya, *Journal of Southeast Asian Studies*, 14(1): 149-168.
- Kuro, Kongo (黒 金剛) 1917, Kinbaori Coal Mine (金包里炭鑛), *Transactions of Taiwan Miner Association*, 39: 5-8.
- Lake, Harry 1894, Johore, *The Geographical Journal*, 3(4): 281-297.
- Latour, Bruno 1987, *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, Mass.: Harvard University Press.
- 2000, A Well-Articulated Primatology: Reflections of a Fellow Traveller, in Shirley C Strum and Linda M Fedigan ed., *Primate Encounters: Models of Science, Gender, and Society*, Chicago: University of Chicago Press.
- Law, John 1986, On the Methods of Long Distance Control: Vessels, Navigation and the Portuguese Route to India, in John Law ed., *Power, Action and Belief: a New Sociology of Knowledge?*, *Sociological Review Monograph*, 32: 231-260. London: Routledge and Kegan Paul.
- Liebenberg, Elri 1997, Mapping British South Africa: The Case of G. S. G. S. 2230, *Imago Mundi*, 49: 129-142.
- Livingstone, David N.
- 2002, Reading the Heavens, Planting the Earth: Cultures of British Science, *History Workshop Journal*, 54: 236-241.

- 2003, *Putting Science in its Place: Geographies of Scientific Knowledge*, Chicago & London: University of Chicago Press.
- Logan, J. R. 1846, On the Local and Relative Geology of Singapore; including notices of Sumatra, the Malay Peninsula, etc. *Journal of the Asiatic Society of Bengal* 14:519-557,667-684. (Reprinted in pages 64-112 of 'Miscellaneous Papers relating to Indo-China' Vol.2, by the Straits Branch of the Asiatic Society in 1886)
- Loh, Fook Seng Philip 1969, *The Malay States, 1877-1895: Political Change and Social Policy*, Singapore; New York: Oxford University Press.
- Macleod, Roy 1996, Reading the Discourse of Colonial Science, in Patrick Petitjean ed. *20th Century Sciences: Beyond the Metropolis*, Vol.2, Colonial Sciences: Researches and institution.
- Massey, D. 2003, Imagining the Field, in Pryke, M. & Rose, G. & Whatmore, S. ed. *Using Social Theory: Thinking through Research*, Londont: SAGE. 71-88.
- Matless, David 1999, The Uses of Cartographic Literacy: Mapping, Survey and Citizenship in Twentieth-century Britain, in Denis Cosgrove ed. *Mappings*, 193-212. London: Reaktion Books.
- Maxwell, George 1907, *In Malay Forests*, Edinburgh and London: William Blackwood and Sons.
- Maxwell, W.E. 1887, The Survey Question in Cochin-China, *Journal of the Straits Branch of the Royal Asiatic Society*, 18: 271-291
- McClellan III, James E. and Francois, Regourd 2000, The Colonial Machine: French Science and Colonization in the Ancien Re'gime, *Osiris*, 15: 31-50.
- Mochiji, Rokusaburou (持地 六三郎)
 —1902, *The Advisory Report for Savage Administration* (蕃政問題ニ 關スル取調書).
 —1912, *The Colonial Policy of Taiwan* (臺灣植民政策).
- Mori, Ushinosuke (森 丑之助) 1917, *Taiwan's Aborigine Tribes* (臺灣蕃族志), reprinted in 1996 by Taipei: SMC Publishing Inc.
- Muldavin, Joshua 2008, The Time and Place for Political Ecology: An Introduction to the Articles Honouring the Life-work of Piers Blaikie, *Geoforum*, 39: 687-697.
- Myers, Ramon H. and Peattie, Mark R. ed. 1984, *The Japanese Colonial Empire, 1895-1945*, Princeton, N.J. : Princeton University Press.
- Nagano, Yoshitora (長野 義虎) 1895, Expedition to the Western Tribes of Savage Districts in Island of Taiwan (臺灣島生蕃地西蕃の探検), *The Journal of Geography*, 8(7): 351-358.
- Nakai, Sozo (中井 宗三) 1914, *Flora of Taiwan, with Special Reference to Timber* (臺灣林木誌), Taihoku: The Bureau of Productive Industry, The Formosan Government (臺灣總督府殖產局).
 —1915, *Illustration for Taiwan Forests Map* (臺灣森林圖說明書), Taihoku: The Bureau of Productive Industry, The Formosan Government (臺灣總督府殖產局).
- Nelson, James Henry 1989, *The Madura Country: A Manual*. reprinted New Delhi: Asian Educational Services. (originally 1868)
- Neumann, Roderick P. 2005, *Making Political Ecology*. London: Arnold.
- Noro, Nei (野呂 寧) 1910, Savage Territory Survey (蕃地測量), *The Taiwan Times* (臺灣時報), 7: 15-17.
- Nuti, Lucia 1999, Mapping Places: Chorography and Vision in the Renaissance. in Dennis Cosgrove ed. *Mappings*, 90-108. London: Reaktion Books.
- Ogawa, Takudzi (小川 琢治) 1896, *The Taiwan Isles* (臺灣諸島誌), Tokyo: The Tokyo Geographical Society (東京：東京地學協會).

- 1897, Several Rock Specimen Collected in Taiwan 〈臺灣の二三岩石〉, *The Journal of Geography*, 9(2): 87-88.
- Olson, M. D. 2002. Indirect rule and the rule of law in Samoa. *Journal of Historical Geography* 28(3): 380-396.
- Ordnance Survey (陸地測量部) 1932, *Outline of Ordnance Survey Enterprise in Taiwan*(臺灣に於けるの陸地測量事業概況), *The Journal of Geography*, 44(7): 377-389.
- Parmer, J.N. 1989, Health and Health Services in British Malaya in the 1920s, *Modern Asian Studies* 23(1): 49-71.
- Peluso, Nancy Lee and Vandergeest, Peter 2001, Genealogies of the Political Forest and Customary Rights in Indonesia, Malaysia, and Thailand, *The Journal of Asian Studies*, 60(3): 761-812.
- Peluso, Nancy Lee 1996, Fruit Trees and Family Trees in an Anthropogenic Forest: Ethics of Access, Property Zones and Environmental Change in Indonesia, *Comparative Studies of Society and History*, 38:510-548.
- Philip, Kativa 1998, English mud: Towards a critical cultural studies of colonial science, *Cultural studies*, 12(3): 300-331.
- Planting in Selangor by a Planter, *The Selangor Journal*, 1890,() 4
- Potter, Lesley 2003, Forest versus Agriculture: Colonial Forest Services, Environmental Ideas and the Regulation of Land-use Change in Southeast Asia, in Lye Tuck-Po, Wil de Jong, Abe Ken-ichi ed. *The Political Ecology of Tropical Forests in Southeast Asia: Historical Perspectives*, Kyoto: Kyoto University Press; Melbourne: Trans Pacific Press, 29-71.
- Formosa Government Army Staff, 1906, *Draft History of the Formosa Government Army Staff* (臺灣總督府陸軍幕僚歷史草案) Vol.3 Reprint, Taipei: Jieyou Press.
- Richards, J. L. 2006, Introduction: Fragmented Lives in Focus: Biography in the history of science, *Isis*, 97:302-305.
- Ritzer, G. 2005, *Encyclopedia of Social Theory*, Vol.1 Thousand Oaks: SAGE
- Robbins, Paul 2004, *Political Ecology: a Critical Introduction*, Malden, Mass.: Blackwell Publishing.
- Robbins, Paul and Bishop, Kristina Monroe 2008, There and Back Again: Epiphany, Disillusionment, and Rediscovery in Political Ecology, *Geoforum*, 39: 747-755.
- Rosenberg, Charles E. and Golden, Janet ed. 1992, *Framing Disease: Studies in Cultural History*, New Brunswick, N.J. : Rutgers University Press.
- Rossiter, David A. 2008, Producing Provincial Space: Crown Forests, the State and Territorial Control in British Columbia, *Space and Polity*, 12(2): 215-230.
- Sack, Robert David 1986, *Human Territoriality: its Theory and History*, Cambridge: Cambridge University Press.
- Sadka, Emily 1968, *The Protected Malay States, 1874-95*, Kuala Lumpur: University of Malaya Press.
- Sato, Kyo (佐藤 茂教) 1974, An Accuse Incident of Toshitora Sone, one analysis based on the Public Records Notes 〈『公文備考』にみる「曾根俊虎被告事件」〉 *Transactions for Japan Society for Southeast Asian History* 〈東南アジア史学会会報〉 23: 2-3.
- 1985, Preliminary Study on Toshitora Sone, a founder of Association for Asian Advancement(興亞會, Kōakai) 〈興亜会創設者曾根俊虎の基礎的研究〉 *Research Notes for Seitoku University* 〈聖徳大学研究紀要〉 18: 77-88.
- Scott, James C. 1998, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT, USA: Yale University Press.

- Schiebinger, Londa 2005, Forum Introduction: The European Colonial Science Complex, *Isis*, 96: 52–55.
- Secretariat to Minister of Agriculture and Commerce(農商務大臣官房) 1895, *Outline of Taiwan Industries*(臺灣產業略誌), Tokyo: Hotta Printing Company.(東京: 堀田印刷所)
- Shih, Tien-Fu (施添福) 1990, The Earth-Ox Borderline and Regional Development in Chu-Chhien of Qing Taiwan: A Study of Historical Geography (清代臺灣竹塹地區的土牛溝和區域發展——一個歷史地理學的研究), *Tai-Wan feng wu* 〈臺灣風物〉, 40(4):1-68.
- Shih, Tien-Fu (施添福) 2000, The Lineage Constitution of Traditional Settlement in Taiwan: A Research Method (臺灣傳統聚落的血緣構成: 以研究方法為中心), *The Yilan Journal of History* (宜蘭文獻), 47: 3-28.
- Shih, Tien-Fu 2001, Spatial Structure and the Development Mechanism of Taiwan's Territorial Society during the Japanese Era: the Case of Min-Hsiung (日治時代臺灣地域社會的空間結構及其發展機制), *Taiwan Historical Research* (臺灣史研究), 8(1): 1-39.
- Sivaramakrishnan, Kalyanakrishnan. 1999, *Modern Forests: Statemaking and Environmental Change in Colonial Eastern India*, Stanford: Stanford University Press.
- Sivasundaram, Sujit 2005, *Nature and the Godly Empire - Science and Evangelical Mission in the Pacific, 1795–1850*, Cambridge: Cambridge University Press.
- Skinner, Allan Maclean 1878, Geography of the Malay Peninsula, *Journal of the Straits Branch of the Royal Asiatic Society* 1: 52-62.
- Sone, Toshitora (曾根 俊虎) 1899, A Journal of Savage Territory Exploration in Taiwan〈臺灣蕃地探檢紀行〉, *The Transactions of Colonial Society* 〈殖民協會報告〉 11(2-12).
- Staum, Martin S. 2000, The Paris Geographical Society Constructs the Other, 1821–1850, *Journal of Historical Geography*, 26(2): 222–238.
- Steel, R. W. 1948, Some Geographical Problems of Land Use in British West Africa, *Transactions and Papers (Institute of British Geographers)*, 14: 27-42.
- Steere, Joseph Beal 1874, Formosa, *Journal of the American Geographical Society of New York*, 6: 302- 334.
- Stone, Jeffrey C. 1982, The District Map: An Episode in British Colonial Cartography in Africa, with Particular Reference to Northern Rhodesia, *The Cartographic Journal*, 19(2): 104-112.
- Storey, David 2001, *Territory: the Claiming of Space*, Harlow, England; New York: Prentice Hall.
- Sugiyama, Yasunori (杉山 靖憲) 1922, *The Achievements of Past Taiwan Governor-Generals* (臺灣歷代總督の治績), Tokyo: Imperial Society for Local Administration (東京: 帝國地方行政學會).
- Sunseri, Thaddeus 2005, Working in the Mangroves and Beyond: Scientific Forestry and the Labour Question in Early Colonial Tanzania, *Environment and History*, 11: 365-394.
- Swettenham, Frank A. 1880, From Perak to Slim, and down the Slim and Bernam rivers, *Journal of the Straits Branch of the Royal Asiatic Society*, 5: 51-68a
- 1881, Some Account of the Independent Native States of the Malay Peninsula, *Journal of the Straits Branch of the Royal Asiatic Society* ,6: 161-202.
- 1885, Journal Kept During a Journey across the Malay Peninsula, *Journal of the Straits Branch of the Royal Asiatic Society*, 15: 1-37.(map p.38)
- 1920, *British Malaya: an Account of the Origin and Progress of British Influence in Malaya*, London: J. Lane.
- Swinhoe, Robert 1858, Narrative of a Visit to the Island of Formosa, *Journal of the North China Branch of the Royal Asiatic Society*, 1(2): 145-164:

- 1864, Notes on the Island of Formosa, *Journal of the Royal Geographical Society of London*, 34: 6-18.
- 1865 – 1866, Additional Notes on Formosa, *Proceedings of the Royal Geographical Society of London*, 10(3): 122-128.
- 1865, List of Species of Mollusks Collected in Formosa, *Proceedings of Zoological Society of London*, part1, 196.
- 1866, List of Species of Mollusks Collected in Formosa, *Proceedings of Zoological Society of London*, part2, 146.
- 1870, Catalogue of the Mammals of China (South of the River Yangtze) and of the Island of Formosa, *Proceedings of Zoological Society of London*, 615-653.
- Swyngedouw, Erik 2003, Modernity and the Production of the Spanish Waterscape, 1890-1930, in Karl Zimmerer & Thomas Bassett eds. *Political Ecology: an Integrative Approach to Geography and Environment-Development Studies*, New York: The Guilford Press. 94-112.
- Taintor, E. C. 1874, The Aborigines of Northern Formosa, *Journal of the North China Branch of Royal Asiatic Society*, 9:53-88.
- Takekoshi, Yosaburo 1907, Japanese Rule in Formosa. Longmans, Green, and Company.
- Takeuchi, Keiichi 1994. The Japanese Imperial Tradition, Western Imperialism and Modern Japanese Geography, in Godlewska, Anne & Smith, Neil *Geography and Empire*. Oxford ; Cambridge, Mass: Blackwells.
- Taylor, George 1887, Folk-Lore of Aboriginal Formosa, *The Folk-Lore Journal*, 5(2): 139-153.
- 1889, Formosa: Characteristic Traits of the Island and Its Aboriginal Inhabitants, *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, New Monthly Series, 11(4): 224-239.
- Teng, Emma 2004, *Taiwan's Imagined Geography: Chinese Colonial Travel Writing and Pictures, 1683-1895*. Cambridge, Mass. : Harvard University Asia Center : Distributed by Harvard University Press.
- Teng-Zeng, Frank K 2006, Science, Technology and Institutional Co-Operation In Africa: From Pre-Colonial to Colonial Science, *EASSRR*, 22(1):1-37.
- The Police Agency (警察本署)1918, *The Chronicle of Savage Control* (理蕃誌稿), Vol.2, Taihoku: Taiwan Daily News Press. (臺北: 臺灣日日新報社)
- The Police Bureau (警務局) 1921, *The Chronicle of Savage Control*, Vol.3, Taihoku: Matsuuraya Printing Company. (臺北: 松浦屋印刷部)
- Thomas, Nicholas 1994, *Colonialism's Culture: Anthropology, Travel and Government*, Oxford: Polity Press.
- Thomson, John 1872 – 1873, Notice of a Journey in Southern Formosa, *Proceedings of the Royal Geographical Society of London*, 17(3): 144-148.
- 1873, Notes of a Journey in Southern Formosa, *Journal of the Royal Geographical Society of London*, 43: 97-107.
- Thrift , Nigel 1999, Steps to an Ecology of Place in Doreen Massey, John Allen, and Philip Sarre ed., *Human Geography Today*. Cambridge: Polity Press.
- Tsurunaga, Juro (鶴長 壽朗) 1935, Forest Conservancy as the Premise of River Conservancy (治山は 所謂治水の要諦なり), *Taiwan Hydraulics*, 5(1): 20-23.
- Tucker, Richard D. 1988, The Depletion of India's Forest under British Imperialism: Planters, Foresters, and Peasants in Assam and Kerala, in Donald Worster ed., *The End of the Earth: Perspectives on Modern Environment History*. Cambridge: Cambridge University Press.
- Ueno, S. (上野 專一) 1894, Notes of the Taiwan travel 〈臺灣島實踐錄〉, *The Journal*

- of *Geography*, 6(72): 683-687.
- Vaccaro, Ismael 2007, Colony/territory Sovereignty, Collective Ingenuity and Moral Economies: The Confluence of Transnational Trends, States and Local Strategies in the Pyrenees, *Environment and History*, 13: 25–46.
- Vandergeest, Peter and Peluso, Nancy Lee 1995, Territorialisation and State Power in Thailand, *Theory and Society*, 24(3): 385-426.
- 2006a, Empires of Forestry: Professional Forestry and State Power in Southeast Asia, Part 1, *Environment and History*, 12: 31–64.
- 2006b, Empires of Forestry: Professional Forestry and State Power in Southeast Asia, Part 2, *Environment and History*, 12: 359–93.
- Vetter, J. 2006, Wallace's Other Line: Human Biogeography and Field Practice in the Eastern Colonial Tropics, *Journal of the History of Biology* 39 (1): 89-123.
- Voon, Phin-Keong 1977, Rural Land Ownership and Development in the Malay Reservations of Peninsular Malaysia, *South East Asian Studies*, 14(4): 496-512.
- Wakimizu, Tetsugoro (脇水 鐵五郎) 1897, miscellany (雜報) Rock Specimen Collected near Mt. Jade 〈玉山附近の岩石〉, *The Journal of Geography*, 9(6):274-276.
- Wang, Tay-Sheng (王泰升) 2008, The Transformation of Civil Laws in Colonial Taiwan under the Interaction of Theory and Policy: Reference to the Santaro Okamatsu Documents (學說與政策交織下的日治台灣民事法制變遷：以岡松文書為中心), *NTU Law Journal* (臺大法學論叢) 37(3).
- Wayte, M. E. 1959, Port Weld, *Journal of the Malayan Branch of the Royal Asiatic Society*, 32(1): 154-167.
- Wicks, Peter C. 1979, Images of Malaya in the Stories of Sir Hugh Clifford, *Journal of the Malaysian Branch of the Royal Asiatic Society*, 52 (1): 57-72.
- Wigen, Karen 2005, Discovering the Japanese Alps: Meiji Mountaineering and the Quest for Geographical Enlightenment, *The Journal of Japanese Studies*, 31(1): 1-26.
- Won, Lin Ken 1965, *The Malayan Tin Industry to 1914, with special reference to the States of Perak, Selangor, Negri Sembilan and Pahang*, Tucson : University of Arizona Press.
- Wong, S. Y. David 1975, *Tenure and Land Dealings in the Malay States*, Singapore: Singapore University Press.
- Wright, D. 2000, *Translating Science: the Transmission of Western Chemistry into Late Imperial China, 1840-1900*, Leiden; Boston: Brill.
- Wu, Wen-Hsin (吳文星) 1997, Tokyo Imperial University and the Commencement of Taiwan Academic Exploration(東京帝國大學與臺灣「學術探檢」之展開), in Huang, Fu-San (黃富三) et al., *An anthology commemorating a century of Taiwan historical research* 〈臺灣史研究一百年：回顧與研究〉 23-40, Taipei: Institute of Taiwan History Preparatory Office, Academia Sinica. (臺北：中央研究院臺灣史研究所籌備處)
- Wu, Yung-Hua (吳永華) 1999, *Plant Hunting in Formosa: A History of Botanical Exploration in Formosa in the Nineteenth Century*, 〈臺灣植物探險：十九世紀西方人在臺灣採集植物的故事〉 Taichung: Chen Hsing Publishing Co. (臺中：晨星出版社)
- Yeh, Er-Jian 2004, 'Introduction', *Section Chang-Hua county, Taiwan Place-name Dictionary* Vol. 11, Taiwan Historica, Nan-tou, Taiwan. (in Chinese)
- Yeh, Er-Jian 2009, Pre-Colonial Geographical Knowledge on Formosa: Preliminary Study based on Japanese Cited Materials, *Journal of Geographical Research*, 51: 45-64.
- Zaki, P. H. Hamzah, M. Z. Ismail, M. H. Awang, K. W. Hamid, H. A. 2010, Malay Customary Tenure and Conflict on Implementation of Colonial Land Law in Peninsular Malaysia, *Journal of Law and Conflict Resolution*, 2(2): 033-045.

Zimmerer, K. S. 2000, Rescaling Irrigation in Latin America: The Cultural Images and Political Ecology of Water Resources, *Ecumene*, 7 (2): 150-175.

Government Publications

Administration Report Selangor 1890

Fukutome, Kinosuke (福留 喜之助) 1910, *Report of Oil Field Prospecting in Taiwan* (臺灣油田調查報告). Taihoku: The Bureau of Productive Industry, the Formosan Government (臺北: 臺灣總督府殖產局).

Hosie, Alexander. 1893, *Report on the Island of Formosa with Special Reference to its Resources and Trade*. Parliamentary Paper, Commercial Hall.

Marine Ministry (海軍省), 1928, *Report on the geological survey of the oil fields in Taiwan* (臺灣油田地質概查報告).

Report of the Board of Production, Civil Service, Formosa Government (臺灣總督府民政局 殖產部報文)

Takahashi, Harukichi (高橋 春吉) and Ichikawa, Yuichi(市川 雄一) 1926, *Explanatory Statements of the Map of Geology and Mineral Resources of Taiwan (Formosa)* (臺灣地質鑛產地圖說明書). Taihoku: The Bureau of Productive Industry, the Formosan Government.

The Bureau of Productive Industry, 1917 *Annual Report for Taiwan Industries* (臺灣產業年報), the Taisho Sixth Year edition, Taihoku: The Bureau of Productive Industry.

The Bureau of Productive Industry, 1931, *Report for Taiwan Forestry* (臺灣林業ノ基本調査書), Taihoku: The Bureau of Productive Industry, the Formosan Government.

The Bureau of Productive Industry, 1937a, *Report for the Forest Planning Enterprise* (森林計畫事業報告書), Vol.1.

The Bureau of Productive Industry, 1937b, *Report for the Forest Planning Enterprise*, Vol.2.

The Draft for Taiwan Historic Materials (DTHM) (臺灣史料稿本) 1900; 1918; 1919.

The Formosan Government Civil List (臺灣總督府文官職員錄), 1906-1917

The Police Bureau (警務局) 1936, *Annual Report for Aboriginal Industrial Instruction* (高砂族授產年報), the Showa Eleventh Year Edition, Taihoku: The Police Bureau.

The Police Bureau 1938, *Report for Aboriginal Races* (高砂族調查書), Vol. 5, Outline for Tribes and their Superstition, Taihoku: The Police Bureau.

The Tropical Industries Survey Organisation (熱帶產業調查會), 1930, *Report for Taiwan Mining Industry*, in *Series of Reports for the Tropical Industries Survey* (熱帶產業調查會調查書 臺灣ノ鑛業).

Archives

Formosa Government Archives

FGA/V4170A2 Government Grant for HAYAKAWA (官有原野豫約賣渡許可地一部返地願並成功賣渡願許可ノ件, 早川鐵治)

FGA/V5686 A2 Report for Forest Survey in Kinajii tribes vicinity (キナジー蕃方面森林調査復命書).

FGA/V10352A1 Government Grant for ZEN (豫約賣渡許可地成功賣渡願許可ノ件, 鄭雅詩)

FGA/V10363 Revised Formosa Government Organ Law(臺灣總督府部內臨時職員設置制中改正ノ件)

Malaysia National Archives

Secretariat Selangor 3719, 1915

Secretariat Selangor 3635, 1916

Perak Government Gazette

PGG, 1890 AR1889 No. 174 Extract from the Annual Report of the Acting Chief Surveyor for the year 1889 pp.248-249

PGG, 1890 No. 441 Circular, Forest Reserves, to District Offices, p.532

PGG, 1891 No. 431 Mining Regulations

PGG, 1891 Order in Council, No. 7 of 1891, Products on State Lands, pp.1027-1030

PGG, 1896 No. 90 Forest Reserves, pp.88-91

PGG, 1897 AR1896 No. 99 Report by the Surveyor in charge of Computations, pp.79-81

PGG, 1906 Federated Malay States, Report on the Lands, Mines and Surveys for the year 1905

Straits Settlements Despatches to Secretary of State

CO273/74 Campbell's Report