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TŌA-OAN (THE BIG POOL) 1653-1983: A HISTORY OF WATER, FORESTS, AND AGRICULTURE IN NORTHERN TAIWAN

 Hung-yi Chien

Featuring shopping streets, financial centres, top national universities, luxury residential complexes, and a large forest park, Da'an District (*Da'an Qu* 大安區) in central Taipei City represents the contemporary city life of bourgeois Taipei. Because it hosts several Chinese-language schools, including the renowned Mandarin Training Center (part of National Taiwan Normal University), Da'an District is also a popular location among international students in Taiwan. However, behind these modern and cosmopolitan images, the historical landscape of the district has long been forgotten. Most people are unaware of a big pool called Tōa-oan 大灣 that lies under today's shopping streets.¹ Moreover, most people are unaware that the story of the big pool serves as a microhistory of environmental modifications since the seventeenth century in Taipei.

Agriculture and colonisation cause fundamental changes to the environment. Eduard Vermeer distinguished five basic forms of agricultural land expansion in premodern China: (1) socioeconomic reconstruction after social unrest, (2) military or civil colonisation promoted by the empire, (3) illegal settlement of migrants in frontiers, (4) expansion or intensification of land exploitation for land development projects, and (5) gradual encroachment of villages on surrounding wasteland.² The history of Tōa-oan attests to Vermeer's final two patterns of land expansion. This history begins with colonisers' exploitation of forest resources, followed by cultivation and irrigation. The intensified land exploitation caused siltation that eventually led to a conflict between reclamation and irrigation parties in the region.

Reclamation and irrigation of the same body of water are in conflict with each other, and the struggle between them is not a new story in premodern East Asia. Shiba Yoshinobu 斯波義信 discussed several cases of water control around Hangzhou Bay 杭州灣 and revealed that siltation is a natural threat

¹ There are three conventions of romanisation adopted in this paper. Modern names and the bibliography are transcribed in Pinyin without tonal markers, which is also the current standard for transcribing place names in Taiwan. For conventionalised names, such as Taipei and Tamsui, I retain them as is. Historical names are transcribed in Peh-oe-ji — the romanisation of Hokkien developed by British and American missionaries in the late nineteenth century. This transcription represents the Taiwanese pronunciation of historical names. For Japanese names, I adopt Hepburn romanisation.

² Eduard B. Vermeer, 'Population and Ecology along the Frontier in Qing China,' in eds Mark Elvin and Liu Ts'ui-jung, *Sediments of Time: Environment and Society in Chinese History* (Cambridge: Cambridge University Press, 1998), p.256.

- 3 Shiba Yoshinobu 斯波義信, 'Environment Versus Water Control: The Case of the Southern Hangzhou Bay Area from the Mid-Tang Through the Qing,' in Elvin and Liu, *Sediments of Time*, pp.161–64.
- 4 Liu Yu-chia 劉育嘉, 'Qing dai taipei pendi de shuili kaifa' 清代臺北盆地的水利開發, *Taiwan wenxian* 臺灣文獻 47.3 (1996): 193–214. Huang Wen-juan 黃雯娟, 'Qing dai taipei pendi de shuili shiye' 清代臺北盆地的水利事業, *Taiwan wenxian* 臺灣文獻 49.3 (1998): 147–69.
- 5 Li Chung-hsin 李宗信, Ku Ya-wen 顧雅文 and Chuang Yung-chung 莊永忠, 'Shuili zhixu de xingcheng yu beng jie: shiba zhi ershi shiji chuqi liugongjun zhi bianqian' 水利秩序的形成與崩解：十八至二十世紀初期瑠公圳之變, in ed. Huang Fu-san 黃富三, *Hai, he yu taiwan juluo bianqian: bijiao guandian* 海、河與臺灣聚落變遷：比較觀點 (Taipei: Institute of Taiwan History, Academia Sinica, 2009), pp.145–228. However, it is necessary to point out that the authors greatly relied on the 1900s map and the official surveys conducted at the beginning of the twentieth century which limits their accuracy on the discussion about the historical landscape before 1900.

to artificial water control. Such cases of water control include artificial reservoirs, dams, and canals that regulate water and utilise it for cultivation, which has benefitted farmers for centuries. However, as demand for arable land increased with population growth, expansion of arable land was prioritised over conservation of water resources. When open space in the region was exhausted, people turned their attention to the reservoirs. This caused the disappearance of the Mirror Lake of Shaoxing 紹興 in the Southern Song dynasty (1127–1279). During the Qing dynasty, in Yuhang 餘杭, a nearby district (*xian*), exploitation and deforestation in the upstream hilly districts intensified erosion, and another reservoir in this region had been completely transformed into paddy fields by the end of the nineteenth century.³ Both lakes were public enterprises maintained by local governments; however, erosion and siltation still resulted in eventual reclamation.

Although Shiba's study of water reservoirs in China is comparable with the case of Tōa-oan, Taiwanese scholars have paid more attention to running water in irrigation systems than to still water in reservoirs. Regarding artificial irrigation in the Taipei, earlier studies have focussed on the construction of such facilities and tried to find common features among them.⁴ Recently, consideration of the geographic factors involved in constructing irrigation channels and their social consequences, such as conceptual communities formed by irrigation channels, has increased. The interrelated interests of the community ensured the maintenance of water conservancy order along the channels. However, this order was challenged by environmental changes caused by deforestation in the upstream hilly region in the late nineteenth century, and the order collapsed prior to Japanese colonial rule.⁵

Although studies on irrigation systems have enhanced our understanding of water control, they have neglected the fact that major irrigation channels in modern Da'an District bypassed and avoided joining Tōa-oan. As a naturally formed and pre-existing body of water, Tōa-oan determined the directions of irrigation systems and politics of agricultural exploitation in this region. Because of bias, studies on irrigation systems have overlooked considerable parts of Da'an District's geographic history and the history of Taipei City. This paper addresses that gap by exploring this history from the mid-seventeenth century to the late twentieth century, from natural forest to modern metropolis.

Methodology

The current area of Da'an District was a rural area of paddy fields and scattered small villages until the mid-twentieth century. Similar to most rural areas in Taiwan, the historical sources that can reveal the district's past are a few land deeds, some lines in the local gazetteers, a simple chronology of an irrigation system, a map surveyed by the Japanese army in the 1900s, and several historical place names. Each source discloses some aspects of old Da'an, but synthetic methodology is required to complete this puzzle. The methodology I adopt was proposed by Japanese historian Hattori Hideo 服部英雄, who recommended conducting fieldwork on site. The historian posited that during fieldwork, a researcher should learn the local pronunciations of place names, record the lifestyle of the place in question, describe the lives of people living around the collected place names, and finally use the collected information, including place names and people's lifestyles, to write the his-

tory. In Hattori's methodology, place names are crucial for connecting other materials to perform historiography.⁶

In the present study of Tōa-oan, place names serve as the essential core; however, interviewing natives for pronunciation and observing local lifestyles is difficult because of the influx of non-native populations, and urbanisation fundamentally disturbed the local culture of Da'an District many decades ago. Instead, I intend to reconstruct local pronunciation and lifestyles from historical linguistic materials. My reliance on literature does not mean that I neglect fieldwork; fieldwork is key to finding traces of the big pool and verifying the literature, especially micro-terrain that is not usually depicted on maps. Adopting this slightly revised methodology, this paper provides a longitudinal history of the environmental changes around Tōa-oan — including deforestation, water control, and siltation — by providing a detailed case study about a geographically trivial but historically significant place.

Etymology of Tōa-oan: Big Pool

Historical place names usually describe geographical features that existed in the past. To connect other historical materials in order to reconstruct the history of Tōa-oan, I provide a short account of the etymology of Da'an and the earlier name of this region, Tōa-oan. The name Da'an, which literally means 'great peace', first appeared in the 1820s. This is an abstract and fortunate name that does not describe any geographical feature; such names are often alterations of earlier names. This is exactly the case with Da'an. Before the 1820s, the name of today's Da'an was Tōa-oan. The land deeds preserved by the *Lîm-an-thài* 林安泰 clan clearly document the change of name.⁷ There have been several interesting attempts to explain this change, but I believe that the inhabitants changed the place name because they simply believed that it sounded better.

Although the change of place name from Tōa-oan to Da'an is evident, the meaning of the previous name is not. Tōa means 'large' in Hokkien, and thus it seems to describe a significant geographical feature, namely *oan*; however, it is unclear to historians what that feature was. According to the *Chinese-English Dictionary of the Vernacular or Spoken Language of Amoy* 廈英大辭典, which was published by American missionary Carstairs Douglas in 1873 and is still authoritative today, *oan* means 'a bay; a bend in a river or channel'.⁸ Tōa-oan is not a coastal location, and thus in this case, *oan* cannot mean a bay. 'A bend in a river or channel' seems more probable. My predecessors, who attempted to explain the etymology of Da'an or Tōa-oan, usually adopted this meaning and believed that Tōa-oan meant 'great bend'. They further suggested the two nearly 90-degree turns of the *Liugong-chun* 璫公圳 — the most important irrigation system in Taipei — as possible candidates for the etymology of Tōa-oan, but could not agree on which bend contributed the name. However, this theory has an obvious chronological fault: the village of Tōa-oan had already been founded by 1741⁹ — two decades before the irrigation channel ran through it in the 1760s.¹⁰ Thus, the etymology of 'great bend' must be rejected.

Language always changes. Douglas's dictionary was published in 1873, and thus the documented language of the time was not the one spoken in the mid-eighteenth century when Tōa-oan was named. Earlier sources are required to decode the etymology. I located *Hoē-im-biāu-gō* 彙音妙悟 — a Hokkien rime

6 Hattori Hideo 服部英雄, *Chimē no rekishi-gaku* 地名の歴史学 (Tokyo: Kadokawa Shoten, 2000), pp.4-5.

7 Wang Shih-ching 王世慶, 'Taibei Antaitang zhi jiapu yu guwenshu' 臺北安泰堂之家譜與古文書, *Taibei wenxian* 臺北文獻 47/48 (1979): 45.

8 Carstairs Douglas, *Chinese-English Dictionary of the Vernacular or Spoken Language of Amoy* (London: Trübner, 1873), s.v. 'oan', p.348.

9 Liu Liangbi 劉良璧, *Chongxiu Fujian Taiwan fu zhi* 重修福建臺灣府志 (Taipei: Taiwan Yinhang, 1961), p.80.

10 'Liugong-chun shi yu fushu guwenshu 璫公圳史與附屬古文書' (unpublished manuscript), pp.18-21. This manuscript is kept by Taipei City Archives (*Taibeishi wenxian weiyuanhui* 臺北市文獻委員會). It is a Chinese translation from a Japanese version; the Japanese original has not yet been discovered.

11 Huang Qian 黃謙, 'Cheng-Po-Hoe-Im-Biau-Go' 增補彙音妙悟, in ed. Ang Uijin 洪惟仁, *Quanzhou fangyan yunshu sanzong* 泉州方言韻書三種 (Taipei: Wuling, 1993).

12 *Ibid.*, s.v. 'oan' 灣 ('bay') and 淵 ('abyss'), p.164.

13 'Cheng-Po-Hoe-Im' 增補彙音, in ed. Ang Uijin 洪惟仁, *Zhangzhou fangyan yunshu sanzong* 漳州方言韻書三種 (Taipei: Wuling, 1993), s.v. 'oan' 灣.

book of the Quanzhou 泉州 dialect first published in 1800. This book has had many reprints with slightly altered titles, and in this paper I refer to the facsimile copy of an 1831 reprint.¹¹ This rime book is believed to represent the Hokkien phonology of the eighteenth century, and it notes brief definitions or examples for most characters under their entries.

In the Rime of *Oan*, I found the character for 'abyss' 淵, which is homophonous to the character of 'bay or a bend of river' 灣; the pronunciations of both characters are *oan*.¹² This is an intriguing entry because the character for 'abyss' is pronounced *ian* in modern Taiwanese and Hokkien, and this pronunciation is also confirmed in Douglas's dictionary. In fact, this entry is not a mistake; it reflects the historical usage of this character. The definition under the character for 'abyss' 淵 notes: 'Vulgar usage; water that runs out but does not flow is called *oan*'. Although this definition is obscure, it indicates that the signified object is something like a water reservoir, and this corresponds to the meaning of the character for 'abyss'. Moreover, the compiler considered that character as 'vulgar usage', which suggests that use of the character for 'abyss' to represent 'pool' was not considered standard. Another rime book compiled in 1820 (the copy referred to was published in 1928), *Cheng-pó-hoē-im* 增補彙音, which documented the Zhangzhou 漳州 dialect of Hokkien, has a similar entry. Under the character for 'bay', the definition notes a bend of water channel, and a name of pool.¹³

Combining the aforementioned two rime book entries, it is clear that in the eighteenth century, a historical word *oan*, 'pool', existed in Hokkien, and Hokkien speakers used the character for 'abyss' or 'bay' to write this word according to the rime books. However, only the character of 'bay' is provided in our sources, and the instance is the place name in question, namely Tōa-oan. The use of this word was waning in the nineteenth century, and by the time Douglas compiled his Amoy dictionary in the 1870s, the word had become obsolete. Therefore, modern historians who do not refer to historical linguistic sources published prior to the mid-nineteenth century cannot correctly decipher the meaning of Tōa-oan, which meant 'big pool' in the eighteenth century when the village of Tōa-oan was named.

The next question is where the big pool was located, and the answer is obvious. A historical pool was situated in the area of today's Da'an District; the pool lasted until 1911, when it was fully drained. The pool was definitely a significant geographical feature; its history can be traced back to the mid-eighteenth century in Chinese sources, and likely back to the seventeenth century in Dutch sources. By investigating these sources, we can uncover a history of environmental change at and around Tōa-oan from the seventeenth century to the twentieth century.

Unnamed River on a Dutch Map

The Dutch East India Company, or VOC (*Vereenigde Oostindische Compagnie*), occupied Taiwan (Formosa) from 1624. The occupation started from an offshore barrier island where Fort Zeelandia was built at today's Anping in Tainan City. The Dutch gradually expanded their domination to the Formosa mainland. In 1642, the VOC expelled the Spanish troops occupying Kelang 雞籠 (today's Jilong 基隆) to control northern Formosa. Today's Taipei City was administered by a junior factor stationed at Fort Antonio in Tamsui. In 1650, Junior Factor Simon Keerdekoek was appointed district chief of Tamsui and Kelang; his most notable achievement was the production of a map of

Tamsui and Kelang that detailed the geography of the region.¹⁴ Keerdekoë's original map no longer exists, but a copy kept at the *Nationaal Archief* in The Hague was traced by Batavia cartographer Johannes Nessel (c. 1655).¹⁵

Keerdekoë's map was likely the first documentation of Tōa-oan. Between No.4 *Kimalitsigowan* and No.9 *Kimotsi* is an unnumbered stream without any notes. This stream joins another stream from the south and flows into a large river (today's Jilong River) at No.9 *Kimotsi*. Ang Kaim 翁佳音 interpreted these lines as irrigation channels built by the aborigines.¹⁶ My interpretation is different. Compared with No.13 *Spruijt van Kimassauw* (lit. Spring of Kimassauw), a similar method of drawing indicates that the unnumbered lines joined at No.9 *Kimotsi* have the same geological characteristic as No.13, and thus they are natural rivers.

A comparison of Keerdekoë's map and *Taiwan Hōzu* 臺灣堡圖 reveals more subtle facts. *Taiwan Hōzu*, surveyed by the Japanese army in the 1900s, clearly shows that two minor rivers ran through today's Da'an before joining together and running for another four kilometres northwards in a curved course, before finally reaching a major river. This stream had many influents and effluents from paddy fields, indicating that these were crucial for local irrigation. Irrigation supplied paddy fields farmed by Han Chinese colonisers from the second half of the seventeenth century. These streams likely underwent many modifications for irrigation in the subsequent centuries, and the result was recorded in the 1900s map *Taiwan Hōzu*.

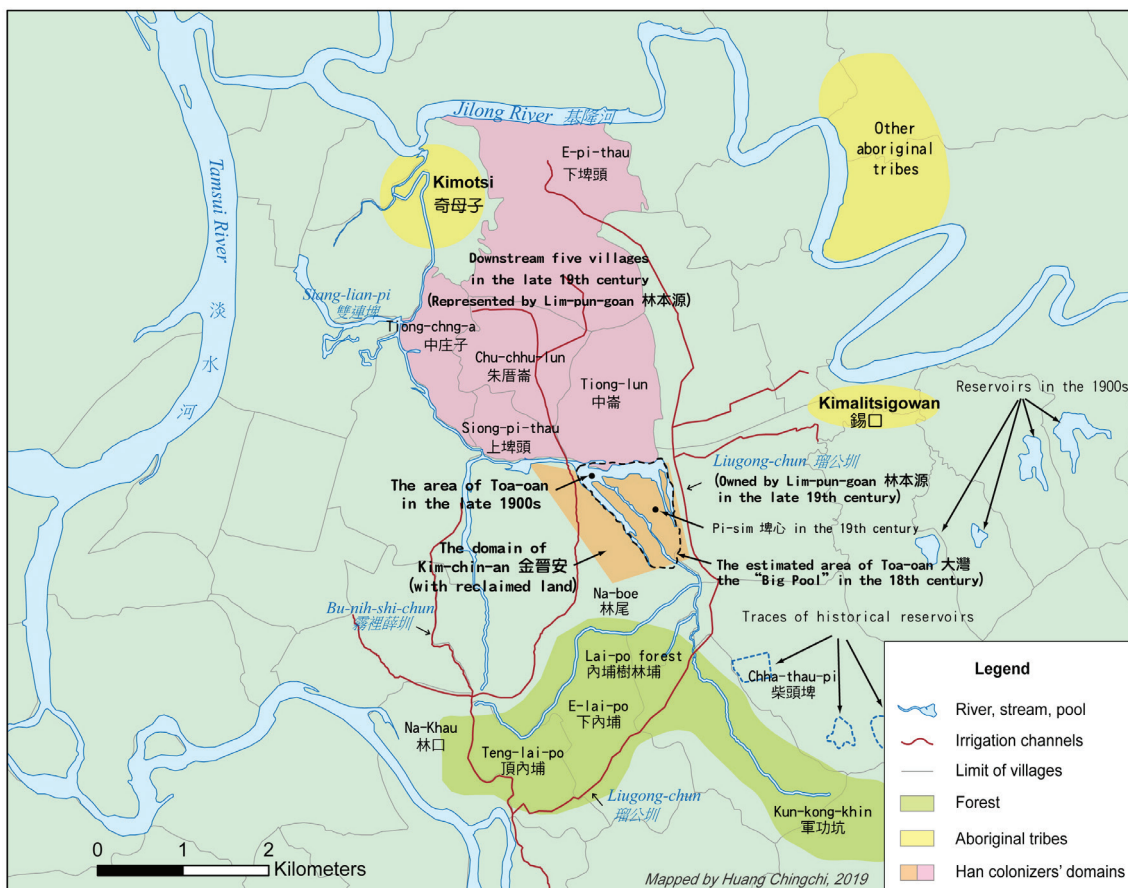
14 Jos Gommans and Rob van Diessen, *Grote Atlas van de Verenigde Oost-Indische Compagnie* (Voorburg: Atlas Maior, 2010), Vol.7, pp.238-39.

15 *Ibid.*, p.239.

16 Ang Kaim 翁佳音, *Da Taibei gu ditu kaoshi* 大臺北古地圖考釋 (Taipei: Daoxiang, 2006), pp.56-57.

Map 1: Comprehensive Map of Area around Tōa-oan — the Big Pool (17th to 19th Century)

Map by Huang Chingchi. The base map is *Taiwan Hōzu* 臺灣堡圖, surveyed in the 1900s.



17 Keerdekoek, 'Corte beschrijvingh wegens,' in Ang Kaim, *Da Taipei gu ditu kaoshi* 大臺北古地圖考釋 (Taipei: Daoxiang, 2006), p.182.

18 Leonard Blussé et al., eds., *De Dagregisters van Het Kasteel Zeelandia, Taiwan, 1629-1662* (Den Haag: Instituut voor Nederlandse Geschiedenis, 1995), Vol.3, p.492, 508; Thomas Pedel and Pieter Elsevier, 'Missive from Captain Thomas Pedel, Merchant Pieter Elsevier, c.s., to Governor Cornelis Caesar. Quelang, 17 May 1655,' in eds Leonard Blussé and Natalie Everts, *The Formosan Encounter: Notes on Formosa's Aboriginal Society: A Selection of Documents from Dutch Archival Sources* (Taipei: Shung Ye Museum of Formosan Aborigines, 2010), Vol.4, pp.52-59.

I translate Dutch 'koopman' 'factor' rather than 'merchant' as the editors did to emphasise that this position is an employee of the VOC and differentiate it from a private merchant who also frequented Formosa in this period.

19 Blussé et al. eds., *De Dagregisters van Het Kasteel Zeelandia, Taiwan, 1629-1662*, Vol.3, p.509.

20 Cornelis Caesar, 'Missive Governor Cornelis Caesar to Merchant Pieter Elsevier. Tayouan, 30 May 1655,' in Blussé and Everts, *The Formosan Encounter*, pp.60-65.

21 Pieter Elsevier, 'Missive Merchant Pieter Elsevier to Governor Cornelis Caesar. Tamsuy 30 June, 1655,' in *ibid.*, pp.66-81.

Two Dutch Officers' Excursions for Wood

Keerdekoek's map must be reviewed alongside his report on the geography of Tamsui and Kelang. Keerdekoek described the flat land as uncultivated (*onbeboude*); this indicates that he noticed the agricultural potential of the locality, which was realised over the subsequent two centuries. However, in the mid-seventeenth century, the VOC focussed on forest resources more than agricultural potential. Keerdekoek mentioned this in his descriptive report but did not provide any further detail about the forest resource because he believed it was irrelevant to the subject of his report; his concern was geography, not exploitation.¹⁷ Thus, we have no record of what Keerdekoek observed.

The first documented Dutch expeditions to the forest resource in northern Formosa were undertaken in 1655. On 30 March 1655, Captain Thomas Pedel was commissioned to explore the forest resource in Tamsui and Kelang. He left Fort Zeelandia with the new chief of Tamsui and Kelang, Factor Pieter Elsevier, on the 19th of April and arrived on the 25th.¹⁸ While Elsevier stayed in Tamsui to assume charge of the administration, Captain Pedel examined the forest around Fort Anthonio in Tamsui and sailed upstream to inspect the forests. He returned to Fort Zeelandia on the 22nd of May and orally reported his findings to Governor Cornelis Caesar and his council.¹⁹ Pedel's oral report was preserved in the *Dagregister* and in Governor Caesar's missive to Factor Elsevier in Tamsui to instruct him how to exploit the forest.²⁰ However, Elsevier felt that the instruction was too difficult to execute; although he visited the same places after Pedel, his observation was not as optimistic as Captain Pedel's report. He replied to the governor with his opinion on the forestry enterprise in the next missive dated 30 June.²¹ Eventually, the council at Fort Zeelandia decided that exploiting the forest in northern Formosa was not worthwhile.

Although no Dutch officers mentioned Tōa-oan in their reports, the evidence suggests they went to the neighbouring region to inspect the forest, and thus their reports can further explain the stream drawn on Keerdekoek's map and help to reconstruct the historical landscape of the region. For this reconstruction, we must scrutinise Pedel and Elsevier's reports. Captain Pedel stated that he sailed upstream and found beautiful forests that 'make many forests in East India feel ashamed' in comparison; however, he only vaguely described the locations. Fortunately, Pedel's oral report left some traces. He described how the people of Tamsui removed logs from the forest. They dammed the river to flood the forest, and the logs that floated were taken down to the main river to Tamsui in *proas* (aboriginal Formosan canoes made by splitting timber in half).²² This method of removing logs indicates that a river or brook flowed through the forest, and the forest must have been situated on relatively flat land so that the dam did not need to be too high. Moreover, downstream, the river needed to have a certain amount of water so that logs could float and be brought down by *proas*. Thus, the river that formed Tōa-oan is a likely candidate for the one that Pedel planned to use to remove logs.

Shortly after Captain Pedel left to report back to Fort Zeelandia, Factor Elsevier made his own excursion for timber. In Factor Elsevier's reply to the governor, he described the location much more clearly than had Pedel. To visit the forest, Elsevier said he ascended a small branch of the river for a Dutch mile (7.407 kilometres).²³ Elsevier must have walked a different branch

of river to the one that Captain Pedel had visited. Elsevier stated that he found fine camphor situated on a high mountain range. Evidently, this was not a place on flat land where people could float logs; however, he believed that it was where Captain Pedel had been. Elsevier noted that the sawn logs could be brought down to the river, although such an enterprise would involve enormous effort.²⁴ Thus, he agreed with Pedel's suggested method of removing logs from the forest through waterways.

Considering Pedel and Elsevier's reports together, it appears they visited a forest composed predominantly of camphor trees that covered highland and lowland areas. The river flowing through the forest had two branches: the one that Pedel planned to dam ran through the lowland forest, whereas the one that Elsevier visited sprang from the forest on the high mountain range. These two branches still existed at the beginning of the twentieth century, and were recorded on a Japanese map surveyed in the 1900s. Although proving the existence of Tōa-oan as a big pool based on the Dutch sources is difficult, the Dutch officers' reports support the existence of such a watershed in the seventeenth century. However, on the twentieth century map, most areas of flat land were paddy fields as opposed to forest. The forest had perished and only the place names preserved traces of it. This toponymic research could further assist in reconstructing the historical landscape and documenting environmental changes around Tōa-oan.

Han Colonisers' Deforestation: Evidence in Place Names

The 1900s *Taiwan Hōzu* preserved many historical place names that had almost faded from modern inhabitants' memories; these historical place names recorded the deforestation and cultivation that occurred around Tōa-oan from the eighteenth century. Environmental changes were caused by the Han colonisers who exploited the forest and farmed the cleared land. Their enterprises eventually left traces in place names such as *Nâ-kháu* 林口, *Nâ-bóe* 林尾, and *Kun-kong-liâu* 軍工寮.

Nâ-kháu and *Nâ-bóe* constitute a pair of place names derived from the historical forest that Captain Pedel visited in 1655. *Nâ-kháu*, literally meaning 'forest mouth', indicates the entrance to a forest. The location of *Nâ-kháu* is near the modern-day main gate of National Taiwan University. *Nâ-bóe*, literally meaning 'forest tail', refers to the end of a forest and likely to the exit from a piece of the historical forest that started at *Nâ-kháu*. *Nâ-bóe* is very close to the centre of today's Da'an District, and on the 1900s map, it was less than a kilometre from Tōa-oan. However, there was an area of naturally elevated land between them, which still leaves observable elevation today. According to a 1940 survey, the relative height of this area was two to three metres,²⁵ which was sufficient to affect the flow of the natural stream and define the direction of irrigation channels.

Nâ-kháu (forest mouth) and *Nâ-bóe* (forest tail) mark the two ends of the historical forest in Da'an. It should be here that Captain Pedel planned to dam a brook to transport felled logs downstream. However, the VOC did not undertake the forestry enterprise in the mid-seventeenth century, and the next literary reference to this forest was made in 1745.²⁶ The 1745 land deed is a lease contract indicating that the headmen from an aboriginal village leased a forest field to a Han farmer. The leaseholder was entitled to fell the trees and cultivate the land in exchange for annual rent. This is the first

22 Caesar, 'Missive Governor Cornelis Caesar to Merchant Pieter Elsevier. Tayouan, 30 May 1655,' p.63.

23 Marc Kooijmans and Judith Ellen Oosterling, *VOC-Glossarium: Verklaringen van Termen, Verzameld uit de Rijks Geschiedkundige Publicatiën, die Betrekking Hebben op de Verenigde Oost-Indische Compagnie* (Den Haag: Instituut voor Nederlandse Geschiedenis, 2000), s.v. 'mijl'.

24 Elsevier, 'Missive Merchant Pieter Elsevier to Governor Cornelis Caesar. Tamsuy 30 June, 1655,' pp.75-76.

25 The surveyed map of 1940 is also retrievable from the Center for GIS, RCHSS, Academia Sinica, 'Taibei-shi bainian lishi ditu' 臺北市百年歷史地圖, online at <<http://gisrv4.sinica.edu.tw/gis/taipei.aspx>>.

26 Tāi-ka-láp-hō Siōng-pi-thâu Tōa-an Ryōsō sōkai hantei no ken hōkoku 大加蚋堡上坡頭、大安兩庄庄界判定ノ件報告, 4241-279, pp.6-7, Taiwan sōtoku-fu gongwen leizuan shuweihoa dang'an 臺灣總督府公文類纂數位化檔案.

- 27 Ch'en Kuo-tung 陳國棟, '“Jun gong jiang-shou” yu qingling shiqi taiwan de famu wenti, 1683–1875' 「軍工匠首」與清領時期臺灣的伐木問題, 1683–1875, *Renwen ji Shehuikexue jikan* 人文及社會科學集刊 7.1 (1995): 125–35. For the local consumption of forest resources, see the discussion in Ch'en Kuo-tung 陳國棟, 'Nonreclamation Deforestation in Taiwan, c. 1600–1976,' in eds Elvin and Liu, *Sediments of Time*, pp.707–12. See also Liu Ts'ui-jung 劉翠溶, 'Han Migration and the Settlement of Taiwan: The Onset of Environmental Change,' in Elvin and Liu, *Sediments of Time*, pp.198–99.
- 28 The Chinese characters of *Kun-kong-khi*ⁿ marked on the 1900s map alternatively suggest that *kong* is represented by the character of 'merit' 功 rather than that of 'work' 工. This is a common alternative because the character of 'merit', making *kun-kong* become 'military merit' 軍功, looks more favourable to ordinary people.
- 29 Some pools are recorded by the 1900s map *Taiwan Hōzu* and the 1939 map of *Kōkyō Pichun liugong-chun kumiai* 公共埤圳璫公圳組合. Both are retrievable from the Center for GIS, RCHSS, Academia Sinica, 'Taibei-shi bainian lishi ditu' 臺北市百年歷史地圖, online at <<http://gissrv4.sinica.edu.tw/gis/taipei.aspx>>.

evidence of deforestation around Tōa-oan, and thus it is worthy of further examination.

Similar to traditional Chinese land deeds, this document names the leased place and its borders in four directions, which (though they are not precisely the four cardinal directions) approximately mark the area of leased forest field. The western border was marked by a *kun-kong-liâu* 軍工寮, which sounds like the word for a hut (*liâu*) for military work (*kun-kong*). This is an intriguing place name; in Taiwan under Qing rule, *kun-kong* specifically referred to the vocation of providing timber, especially camphor, to build military ships. This was a privilege because military lumberjacks could dominate forest resources exclusively. Ch'en Kuo-tung highlighted that military lumberjack chiefs monopolised the lawful exploitation of forest resources from the establishment of a military shipyard in 1725 right through to 1875. However, because deforestation was necessary before cultivation, no restrictions against felling trees on authorised plantations were issued against ordinary colonisers. In addition, the resources that ordinary colonisers gained by clearing fields before cultivation such as lumber, rattan, and refined camphor were still under the military lumberjack chiefs' monopoly.²⁷ In the case of Tōa-oan, the existence of *Kun-kong-liâu* can suggest the military lumberjack chiefs' activities around the pool during the deforestation before ordinary farmers began agricultural exploitation there.

Kun-kong-liâu was the temporary base of military lumberjacks near a forest. As the mark of the western border, this base indicates that certain forestry activities occurred near Tōa-oan before 1745 and that the forest featured camphor — the most valuable wood in Taiwan — which was sought by the Dutch. This *kun-kong-liâu* did not become a long-lasting place name but other *kun-kong-liâu* did. The nearest one to Tōa-oan called *Kun-kong-khi*ⁿ 軍功坑 (*Kun-kong* ravine) was marked on the 1900s map²⁸ and was approximately four kilometres southeast of the big pool. It mirrors the Dutch source that stated that Elsevier ascended a branch of Tōa-oan for more than seven kilometres and found the finest camphor trees on a high mountain range. What Elsevier found in 1655 must be the same place that the woodcutters named *Kun-kong-khi*ⁿ. However, because of deforestation, the area between Tōa-oan and *Kun-kong-khi*ⁿ had become wilderness by the 1900s; the camphor trees were long gone.

Cultivation, Irrigation, and Muddy Runoff

Deforestation was conducted throughout the eighteenth century. According to the 1745 deed, the land would be cultivated after the wood had been cleared. Once the wood field became a paddy field, more agricultural infrastructure followed. Most of the first irrigation facilities were built at the foot of the mountain where ravines could be dammed to form small reservoirs to water the field.²⁹ The 1745 deed stated that the eastern border was 'the big mountain range'. Ravines suitable for building reservoirs must have been present, but there are no traces of any such ravines in place names. Some reservoirs in nearby regions survived until the 1900s and are reflected in several place names with *pi* 陂 (irrigation pool). These small reservoirs offered limited water, and thus water shortages were inevitable when the paddy fields expanded. Thus, it became necessary to channel water from upstream rivers. By the 1760s, two major irrigation systems had been completed in Taipei. However, the channels of both systems avoided joining Tōa-oan; this was an

understandable choice because there was no reason to pour precious water channelled from the deep mountain into a pool, and the fields around the big pool and those downstream did not require artificially channelled water because they had the pool. Thus, the existence of Tōa-oan determined the watercourses of these major irrigation channels.

Although people would be unlikely to pour fresh water into a pool, farmers still needed to drain runoff, which contained more sand and silt after cultivation. When water carrying sand and silt flowed into the relatively calm Tōa-oan, siltation accelerated. Siltation is natural but not neutral. These natural processes yielded winners and losers and eventually led to a dispute between farmers upstream from Tōa-oan and those downstream.

Conflicting Interests between Downstream and Upstream Farmers

Although Tōa-oan was a naturally formed pool, it was privately owned. The ownership of Tōa-oan is difficult to determine from existing sources, but it was not necessarily important for a long period because the pool had little direct economic value except for small-scale fishing. Upstream deforestation and cultivation changed this situation; as the runoff carried sand and mud into Tōa-oan, siltation intensified. The deposited sediment could be reclaimed and used to create fertile fields, and the owner(s) of the pool were entitled to the newly reclaimed land and to reap profit. This made ownership of Tōa-oan attractive; however, reclamation reduced the size of the pool and affected downstream irrigation.

The 1745 deed suggests that Tōa-oan — the most significant waterbody in this area — had been used to water paddy fields. The alternative name of Tōa-oan in later years — *Siōng-pi* (upper irrigation pool) — denotes its agricultural purposes. Thus, the big pool must have been exploited for irrigation prior to 1745. As illustrated in the following discussion, downstream farmers did not need to purchase water from artificial channels for irrigation; they simply took water from Tōa-oan. As reclamation of Tōa-oan expanded, water storage suffered. Therefore, the wealth of the landlord of Tōa-oan was based on the losses of the landlords downstream, and thus conflict was inevitable.

The process of siltation in Tōa-oan cannot be reconstructed because the earliest map depicting Tōa-oan as a pool is from the 1900s. Viewers of this *Taiwan Hōzu* map must be aware that the bank line depicted was a result of siltation, and the assumption that the 1900s map depicts the situation in previous centuries is anachronistic. In the following discussion, we observe that the reclamation began in the nineteenth century, and the siltation in the pool must have begun even earlier. In Tōa-oan, the place name *Pi-sim* 陂心 (heart of pool, for irrigation), marked on the west bank of Tōa-oan suggests that the place was once in the middle of Tōa-oan, serving as convincing evidence that *Taiwan Hōzu* reflects the result of the reclamation of Tōa-oan.

The first document to attest to the existence of reclaimed land in Tōa-oan is the deed of absolute sale in 1860. According to the deed, corporate landlord *Kim-chìn-an* 金晉安 purchased a large quantity of real estate, including a big pool — that is, Tōa-oan, the reclaimed lands, the cultivated and uncultivated fields, and the building plots. The transaction was settled with 600 Spanish peso (*real de a ocho*). This deed served as evidence that this landlord presented to claim his dominance of Tōa-oan.³⁰ Another document regarding the reclaimed land and *Kim-chìn-an* is dated 1872. A peasant who had leased land

30 *Tāi-ka-láp-hō Siōng-pi-thâu Tōa-an ryōsō sōkai hantei no ken hōkoku* 大加納堡上坡頭、大安兩庄庄界判定ノ件報告, 4241-279, pp.9-10.

- 31 Taiwan yinhang jingji yanjiu-shi 臺灣銀行經濟研究室 ed., *Qingdai Taiwan dazuo diaochashu* 清代臺灣大租調查書 (Taipei: Taiwan Yinhang, 1963), pp.853–54
- 32 Zheng Yongxi 鄭用錫, *Tamsui-ting zhi gao* 淡水廳志稿 (Nantou-shi: Taiwan-sheng wenxian weiyuanhui 臺灣省文獻委員會, 2006), p.29.
- 33 Lin wanchuan 林萬傳, 'Da'an Poxin Linzhai Ji Qi Renwu' 大安坡心林宅及其人物, *Taibei wenxian* 臺北文獻 73 (1985), p.190; Lin Wanchuan 林萬傳 ed., 'Da'anqu Qilao Zuotanhui Jilu' 大安區耆老座談會紀錄 *Taibei wenxian* 臺北文獻 89 (1989): 17.
- 34 Chung-hsin 李宗信 et al., 'Shuili zhixu de xingcheng yu beng jie: shiba zhi ershi shiji chuqi liugongjun zhi bianqian,' p.178.

from *Kim-chin-an* to build his house asked the landlord to lease him another piece of newly reclaimed land for cultivation.³¹ These documents suggest that Tōa-oan had been shrinking because of deforestation upstream and accelerated siltation since the mid-eighteenth century. By the mid-nineteenth century, reclamation had been undertaken to a certain degree. The landlord who claimed ownership of the pool benefitted from the siltation because possessing the pool gave him the right to occupy the newly reclaimed land. Therefore, profit was earned by not only growing crops but also enlarging the land area. The corporate landlord *Kim-chin-an* was the greatest beneficiary of siltation.

While *Kim-chin-an* reaped the benefits of the aforementioned change, the downstream farmers worried about the shortage of water. The shrinking Tōa-oan stored a decreasing amount of water for irrigation of the downstream fields, and the downstream farmers had to react to prevent water shortages in the mid-nineteenth century. Clearly, the downstream farmers did not purchase a large piece of land to build a reservoir; it was neither economical nor necessary to do so because they had Tōa-oan to water their fields. However, the lack of ownership meant that downstream farmers were unable to prevent other people from trespassing on their water resource, and they were concerned about this.

When the downstream inhabitants noticed that Tōa-oan was shrinking because of siltation in the early nineteenth century, they undertook a project to clear the sediment and likely repair the gates and channels that routed water to their fields. They had this undertaking noted in the local gazetteer in 1834 to secure their enterprise.³² Nevertheless, natural siltation continued, and the upstream landlords continued their artificial reclamation efforts.

Lawsuit Dated 1895 on the Reclamation of Tōa-oan and the Ruling

Eventually, the conflict between upstream landlord and downstream farmers escalated in the final years of Qing rule in Taiwan. The upstream landlord *Kim-chin-an* reclaimed more land from Tōa-oan, and this infuriated the farmers from the five downstream villages. They gathered men to tear down the banks for reclamation and then sued *Kim-chin-an* for their reclamation of Tōa-oan. The lawsuit was significant because the upstream corporate landlord was powerful; notable members of the corporate landlord included the Lîm family of *Pi-sim* 陂心林家, who built a luxury residence next to Tōa-oan (akin to a floating fortress), and organised martial arts training groups among the young men in their lineage, thereby creating a virtual private army. The flagpole in front of the residence indicated that a family member held a degree from the imperial examination — a significant symbol of the local elite. When the Lîm family built their luxury residence in 1853, they ordered porcelain tiles and many other excellent materials from China. Barges carried these materials from Tamsui by ascending the rivers to Tōa-oan and finally anchoring in front of the Lîm's residence to unload.³³ This route brings to mind the Dutch officer's idea to flow timber down the waterway. The Lîm family transported their valuable materials in the opposite direction.

The downstream landlords were also prominent. One was *Lîm-pún-goân* 林本源 — the richest familial corporation in northern Taiwan, who possessed tremendous estates, luxury residences, and a beautiful garden. Moreover, *Lîm-pún-goân* fully owned Liugong-chun from 1829.³⁴ The water

from Liugong-chun flowed through the upstream paddy fields and the runoff became one of the head waters of Tōa-oan. Therefore, *Kim-chin-an's* estates and Tōa-oan were geographically and hydrographically surrounded by *Lîm-pûn-goân's* dominance.

The district magistrate's ruling on 14 January 1895 favoured the downstream contingent.³⁵ Evidence of ownership presented by those upstream was refuted, and the upstream landlords were found guilty of reclaiming Tōa-oan, but this action was pardoned because their reclamation had been destroyed by men downstream. No further reclamation was allowed, but the legal status of the existing reclaimed fields from the pool was reaffirmed because they had been surveyed, registered, evaluated, and levied by the government since 1889. The downstream landlords inscribed the ruling's placard on a stele to commemorate it and warn others not to covet their water.³⁶ The downstream landlords had secured their water, but the Qing empire was losing the war against Japan. On 17 April, approximately three months after the ruling, the Qing empire ceded Taiwan to Japan, and the battles in Taiwan after 29 May brought the island into chaos.

It took several years for Japan to restore order and even longer to establish a firm base for colonial rule in Taiwan. One of the pillars to support colonial rule was to modernise land control in order to lay a firm financial foundation. Thus, Gotō Shinpei 後藤新平, the second in command in colonial Taiwan between 1898 and 1906, founded the Temporary Taiwan Land Survey Bureau (*Rinji Taiwan Tochi Chōsa Kyoku* 臨時臺灣土地調查局) to register all land, study the local customary law, and survey the new colony. The product of the survey was the aforementioned 1900s map *Taiwan Hōzu*. The upstream landlord *Kim-chin-an*, who lost the lawsuit under the Qing administration, now considered the land survey an opportunity for revenge. In March 1900, *Kim-chin-an* hired a Japanese attorney to submit a petition to the land survey bureau. The attorney's letter revealed more about the upstream landlords' ambitions; they not only claimed the title of Tōa-oan, thereby reaffirming their right to levy the reclaimed fields, but also demanded the right to charge downstream farmers for using the big pool to water their fields.³⁷ To counter this demand, the downstream party cited the January 1895 ruling and presented it to the bureau.³⁸

To deal with this petition, the Japanese official in charge wrote a proposal dated 13 June, reporting his investigation of boundary issues between villages and the title of the pool. He examined documents presented by both parties, interviewed local elders, and observed the geography around Tōa-oan. His judgement was that Tōa-oan was actually a section of a natural river, even though the landlords called it an irrigation pool. Because Tōa-oan was naturally formed, he proposed drawing the boundary of the surrounding villages in the middle of Tōa-oan so that no local party could dominate the pool. This became the boundary shown on the 1900s map *Taiwan Hōzu*. Moreover, Tōa-oan was the source of several smaller irrigation pools downstream, and the farmers had installed gates in the watercourse to divert water into their fields. Thus, if implemented, the upstream party's demands to levy the water would affect hundreds of downstream farmers and lead to further conflict. So, regarding the demand for title, the official suggested treating Tōa-oan as a common river, thereby implying de facto nationalisation.³⁹ This proposal was approved in March 1901.⁴⁰ It was now the colonial government's prerogative to decide the future of Tōa-oan.

35 The date is converted to the Gregorian calendar. The original date is the 29th day of the 12th month, the 20th year of Guangxu 光緒二十年十二月二十九日.

36 The stele was re-erected recently next to the local temple worshipped by the people of Tòng-lūn 中崙, one of the five downstream villages.

37 Tāi-ka-láp-hō Siong-pi-thâu Tōa-an ryōsō sōkai hantei no ken hōkoku 大加蚋堡上坡頭、大安兩庄庄界判定ノ件報告, 4241-279, pp.16-18.

38 *Ibid.*, pp.11-12.

39 *Ibid.*, pp.2-3.

40 Tāi-ka-láp-hō Tōa-an-pi-sō sōkai no ken 大加蚋堡大安陂庄界ノ件, 4241-280, Taiwan Sōtoku-fu Gongwen leizuan shuwei-hua dang'an 臺灣總督府公文類纂數位化檔案.

- 41 Li Chung-hsin 李宗信, *Liugong Da Chun* 璫公大圳 (Taipei: Yushan she, 2014), pp.107–16.
- 42 'Taihoku-chō Kaikonchi gyōshuken nintei' 臺北廳開墾地業主權認定, 5710–711, Taiwan Sōtoku-fu gongwen leizuan shuwei-hua dang'an 臺灣總督府公文類纂數位化檔案, pp.100–101.
- 43 The process of urbanisation is recorded by published maps of Taipei City from 1950 to 1980. More than twenty maps and aerial photos are viewable online in 'Taibei-shi bainian lishi ditu' 臺北市百年歷史地圖, Center for GIS, RCHSS, Academia Sinica, 'Taibei-shi Bainian Lishi Ditu' 臺北市百年歷史地圖, <<http://gisrv4.sinica.edu.tw/gis/taipei.aspx>>.
- 44 Hsu Cheng-kuang 徐正光, *Taibei kejia jielu shi: tonghua pian* 臺北客家街路史: 通化篇 (Taipei: Taibei-shi Zhengfu Minzheng Ju 臺北市政府民政局, 1998).
- 45 'Nian wu xiang paishui fanghong gongcheng wangong' 廿五項排水防洪工程完工, *Lianhe bao* 聯合報 *United Daily News*, 2 September 1983.

Final Reclamation and Urbanisation: 1900–83

Agriculture was the primary economic sector in Taiwan under Japanese colonial rule, and the colonial government aimed to increase production. The surplus could build a firm financial foundation for the colony and supplement the wider Japanese empire, for which food supply was a key concern. To achieve this goal, the colonial government implemented numerous policies to improve agricultural production. In addition to the land reform executed by the Temporary Taiwan Land Survey Bureau, reform of the irrigation system was initiated in the mid-1900s, which unified irrigation systems in a region under a single authority to improve efficiency.⁴¹

Subsequently, the efficiency of irrigation in Taipei significantly increased, and traditional irrigation pools were no longer necessary. Tōa-oan ceased to serve an irrigation function, and the big pool was drained and reclaimed for more productive purposes. Eventually, the authority that managed irrigation in Taipei drained and reclaimed Tōa-oan. The project commenced after the harvest of 1910 and was completed by the sowing of 1911.⁴² The reclaimed Tōa-oan became a narrow river to receive and drain the original headwaters from the upstream area.

The next great change for Tōa-oan occurred in the 1960s, and this time the impetus was on not agriculture but urban development. Urbanisation in eastern Taipei City accelerated during this period. Two boulevards (Zhong-xiao East Road and Ren'ai Road) across the reclamation of the historic Tōa-oan were gradually completed in the 1950s and 1960s, and the magnificent Ren'ai Roundabout was placed at the centre of the land reclaimed from Tōa-oan. As shown in maps of Taipei City from this period, many residential complexes were erected along these new roads, and the historical watercourse left by Tōa-oan was completely surrounded by dense, modern concrete buildings.⁴³ However, much of the infrastructure was unable to keep pace with rapid urbanisation. The site where the two headwaters joined was called *Lām-té* 濫底 (mud bottom), indicating that the earth was unstable because of constant flooding. When the mud fields became residential areas, the residents inevitably experienced floods after heavy showers. This situation did not improve until 1966, when the city diverted the headwaters.⁴⁴ Another problem was sewage: no adequate underground system was in place, so residents simply ditched their waste into the nearest watercourse, and the historical watercourse left by Tōa-oan filled up with putrid sewage. By 1983, Taipei City culverted the open-air channel to improve the environment.⁴⁵ Subsequently, the last above-ground remains of Tōa-oan disappeared with the development of the main shopping district, and the big pool soon faded from collective memory.

Concluding Remarks

As described in this paper, I have synthesised various sources from Dutch archives, place names, and land deeds for modern urban planning to reconstruct the history of Tōa-oan since the mid-seventeenth century. By revisiting the history of Tōa-oan and Da'an, I have rediscovered the forgotten past of this modern metropolis. Toponymic study was essential in this reconstruction because historical place names are crucial links that connect sources from different periods and in different languages. Dutch officers envisioned the exploitation of forest and land resources in the mid-seventeenth century,

and planned to fell trees upstream from Tōa-oan and transport the logs down the river. Ultimately, this exploitation was accomplished not by the Dutch but by the subsequent Han Chinese colonisers, who had cleared the forest on the plain by the mid-eighteenth century, as shown in the surviving land deeds.

Deforestation, cultivation, and intensified irrigation rendered the muddy runoff flowing into Tōa-oan, and this increased siltation in the pool. This siltation benefitted the party claiming to be the landlord of the pool because it gained more arable land; however, it also reduced water resources for the irrigation of downstream villages. The conflict between the upstream landlord and downstream farmers resulted in a well-documented dispute over the ownership of Tōa-oan. The landscape around Tōa-oan at the end of the nineteenth century can be reconstructed based on a Japanese official's investigation, which supported earlier sources suggesting that Tōa-oan was part of a natural river, and Tōa-oan was then *de facto* nationalised; this decision eventually resolved the dispute and determined the fate of Tōa-oan in the twentieth century.

As suggested at the beginning of this paper, the history of Tōa-oan reflects two basic forms of agricultural land expansion in premodern China — land development projects and gradual encroachment on villages. This study agrees with Vermeer's basic concepts but also portrays a more complicated situation involving siltation and ownership. In contrast to the lakes around Hangzhou Bay discussed by Shiba Yoshinobu, which were public enterprises, private ownership meant that siltation caused benefits and losses for different groups of people, resulting in conflict. This conflict across six villages in Taipei is historic, and the consequence, namely *de facto* nationalisation, determined the landscape of this region in the twentieth century. As the history of irrigation in other parts of Taiwan at the beginning of the twentieth century shows, infiltration from colonial rule seems inevitable, and Tōa-oan might have lost its function and ended up fully reclaimed without the conflict. However, although the conflict over water was a significant event in Taipei, it has now largely been forgotten. By reconstructing the longitudinal history of Tōa-oan, this research enhances our understanding of this region and contributes a notable case for future comparative studies on deforestation, water control, and urbanisation in environmental history.

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Glossary

Terms	Chinese characters	Meaning / Translation
Cheng-pó·hoē-im	增補彙音	a Hokkien rime book in Zhangzhou accent published in the early 19th century
Chinese-English Dictionary of the Vernacular or Spoken Language of Amoy	廈英大辭典	a dictionary compiled by American missionary Carstairs Douglas in 1873
Da'an	大安	place name; lit. 'great peace'
Gotō Shinpei	後藤新平	personal name
Hangzhou Bay	杭州灣	a bay in Zhejiang province, China
Ho Kíp-tian	何及展	personal name
Hoē-im·biāu-gō'	彙音妙悟	a Hokkien rime book in Quanzhou accent published in 1800
ian	淵	abyss
Jilong River	基隆河	name of a major river
Kim-chìn-an	金晉安	name of a corporate landlord
Kun-kong-chhiū ⁿ -siú	軍工匠首	military lumberjack
Kun-kong-khi ⁿ	軍功坑	place name; lit. Kun-kong ravine
Kun-kong-liáu	軍工寮	naval lumberjack's hut; lit. military work hut
Lām-té	濫底	place name; lit. mud bottom
Lîm family of Pi-sim	陂心林家	a clan's name
Lîm-pún-goân	林本源	a clan's name
Liugong-chun	瑠公圳	Master Liu's Channel
Nâ-bóe	林尾	place name; lit. forest tail
Nâ-kháu	林口	place name; lit. forest mouth
oan	灣/淵	pool (obsolete after the 19th century)
oan	灣	a bay; a bend in a river or channel
Pi-sim	陂心	place name; lit. pool heart
Quanzhou	泉州	a historical prefecture in Fujian province, China
Shaoxing	紹興	a city in Zhejiang province, China
Siōng-pi	上陂	name of a pool; alternative of Tōa-oan
Taipei City / Taihoku-shi	臺北市	a modern political division since 1920
Taiwan Hōzu	臺灣堡圖	title of the map surveyed in the 1900s
Tamsui	淡水	place name; lit. fresh water
Tamsui River	淡水河	the modern name of the largest river in Taipei
Temporary Taiwan Land Survey Bureau/ Rinji Taiwan Tochi Chōsa Kyoku	臨時臺灣土地調查局	the agency in charge of land survey
Tōa-oan	大灣	place name; lit. big pool
Tōa-oan-chng	大灣莊	place name; lit. Tōa-oan village
Yuhang	餘杭	historical district in Zhejiang province, China
Zhangzhou	漳州	historical prefecture in Fujian province, China