

The Making of the Sino-Japanese Hybrid Raft: Colonial Discourse and the Limits of Technological Replacement on the Yalu River *

Xiang CHI[†]

Introduction

In 1918, after completing his survey of the Changbai Mountain (Paektu Mountains) region, the Japanese explorer Fukaya Shōtō 深谷松濤 returned to Andong by rafting down the Yalu River from Hyesan. In his memoir, “A Perilous Journey on the Yalu River,” he vividly recorded the dangers of the voyage:

“Departing from Hyesan, we drifted down the Yalu River on a raft, relying entirely on a single timber raft for the journey of 160 *ri* 里 to Andong County. Along the way, raging rapids and hidden reefs presented obstacles comparable to the treacherous waters of the Wu Gorge 巫峽. The raft was damaged, and the rudder broken, yet in the end we managed to arrive safely.”¹

Fukaya’s account not only illustrates the formidable navigational conditions of the Yalu River, but also reveals a distinctive mode of timber transportation in the modern Yalu River forestry. Since the late Qing period, with the exploitation of forest resources in the Yalu watershed, timber rafting gradually became a crucial means of transport linking logging sites in the Changbai Mountains with downstream markets. Although rafting was continually threatened by rapids, submerged rocks, and seasonal hydrological fluctuations, this mode of transportation did not disappear with the rise of modern industrial forestry operations and new transportation technologies. On the contrary, it persisted in the Yalu River basin well into the early

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[†] Institute of Modern History, Chinese Academy of Social Sciences; Tsinghua University, chixiang@cass.org.cn.

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¹ Fukaya Shōtō 深谷松濤 and Furukawa Tekifū 古川狄風, *Survey and Exploration of Manchuria and Mongolia* 滿蒙探檢記, trans. Yang Fengqiu 楊鳳秋 (Guangzhou: Jinan daxue chubanshe, 2018), 125. The unit 里 in Fukaya’s original Japanese text refers to the Japanese *ri* (approximately 3.9 kilometers). At 160 *ri*, this corresponds to approximately 624 kilometers.

twentieth century and remained an integral component of the forest extraction and transport system.

In September 1908, the Sino-Japanese Yalu River Timber Company was formally established in Andong, marking Japan's gradual acquisition of a dominant role in the logging and management of forests on the Chinese side of the Yalu River. The Company undertook systematic reforms in logging, timber collection, and transportation; yet compared with the rapid adoption of power-driven sawmill equipment, technological improvements in raft building and driving progressed far more slowly. The complex hydrological conditions of the Yalu River, combined with the entrenched practices of local Chinese laborers, made it difficult for the Company simply to introduce Japanese rafting methods—themselves rooted in pre-industrial craft traditions—as a straightforward replacement for existing local practices. It was not until 1913, when Murata Shigeharu 村田重治 assumed the position of Japanese Managing Director, that the Company began to systematically pursue the reform of traditional raft construction and driving practices, a program that would formally take shape the following year. Even so, local rafting practices never entirely disappeared: what emerged was not replacement but coexistence, and at times hybridization, between existing local methods and the Japanese rafting techniques being introduced. These two systems came to be known in Japanese sources as “Chinese-style rafts” and “Japanese-style rafts,” categories that were themselves coined through colonial intervention: before Japanese administrators began classifying local practices, no such distinction existed on the Yalu River. It is this constructed distinction, and the technological conflicts and hybrid outcomes it generated, that this article sets out to examine.

Existing scholarship has largely examined the forestry development in the Yalu River basin from the perspectives of Qing's “closing-off” frontier administration, Japanese colonial expansion, and the exploitation of forest resources, while paying comparatively little attention to rafting technology itself and its transformation over time.² Beyond the Yalu River basin, studies of watercraft technology and indigenous

² Previous scholarship focuses on migration-based frontier settlement, forestry development and colonial exploitation, see David Bello, “The Cultured Nature of Imperial Foraging in Manchuria,” *Late Imperial China* 31:2 (2010), 1–33; Jonathan Schlesinger, *A World Trimmed with Fur: Wild Things, Pristine Places, and the Natural Fringes of Qing Rule*, (Stanford: Stanford University Press, 2017); Seonmin Kim, *Ginseng and Borderland: Territorial Boundaries and Political Relations Between Qing China and Choson Korea, 1636–1912* (Berkeley: University of California Press, 2017); Kwangmin Kim, “Fighting to Keep the Land Wild: Huifang and Vernacular Forestry in Nineteenth-Century Manchuria,” *Late Imperial China* 45:1 (2024), 79–115; Wang Xiliang 王希亮, “Colonial Development and the Transformation of Ecological Space in Northeast China's Forests in Modern Times 近代中國東北森林的殖民開發與生態空間遷移,” *Historical Research* 歷史研究, 1 (2017), 123–140; Ayumu Yasutomi 安富歩 and Yoko Fukao 深尾葉子 eds., “The Formation of ‘Manchuria’: Forest Depletion and the Creation of Modern Space” 「滿洲」の成立：森林の消盡與近代空間的形成 (Nagoya: Nagoya University Press, 2009); Ye Lei 葉壘, “The Yalu River Timber Company and Japan's Colonial Intervention in Northeast China's Forestry Production (1908–1931) 鴨綠江採木公司與日本對

craft knowledge have tended to focus on either material reconstruction or discrete regional traditions, rarely examining how such technologies were transformed under colonial pressure or how local knowledge was selectively absorbed into colonial extractive systems.³

Scholars have demonstrated how the language of “civilization” and “modernity” functioned as instruments of colonial authority in East Asia. Ruth Rogaski’s *Hygienic Modernity* shows how the discourse of *weisheng* legitimized imperial intervention by casting Chinese bodies and practices as deficient.⁴ Yuting Dong has shown that colonial projects in Northeast China operated not by replacing local knowledge but by selectively incorporating it.⁵ Aaron Moore further demonstrates how technology functioned as an ideological framework for colonial mobilizations; and Victor Seow’s *Carbon Technocracy* reveals that Japanese technocratic ambitions remained deeply dependent on human labor despite their mechanizing rhetoric.⁶ By examining timber rafting, a sector where technology, labor, and ecological knowledge were inseparable, this article shows that colonial discourse could produce its own internal contradictions: the techniques promoted as emblems of “civilized” technology were themselves rooted in the same pre-industrial craft traditions as the practices they sought to displace.

The most directly relevant recent work is Joseph Seeley’s *Border of Water and Ice* (2024), which examines the Yalu River as an imperial borderland shaped by the movements of water, ice, timber-cutters, smugglers, and anti-Japanese guerrillas.⁷ While Seeley’s environmental and border history framework illuminates the fluid,

東北林業生産の殖民介入（1908—1931），” *Modern Chinese History Studies* 近代史研究, 3 (2022), 92–115; Recent scholarship has paid attention to the timber laborers known as “muba” and their floating log conflicts, see Joseph A. Seeley, *Border of Water and Ice: The Yalu River and Japan’s Empire in Korea and Manchuria* (Ithaca, NY: Cornell University Press, 2024). Regarding the studies of technology transfer in the Japanese empire in Korea, see Kim Tae-hyeon, “The Background of Japan’s Enactment of the Korean Forest Special Accounting Law and the Nature of the Forestry Bureau’s Operations, 1905–1910 일제의 한국삼림특별회계법 제정 배경과 영림창 운영의 성격 (1905–1910),” *Urban Studies: History, Society, and Culture* 도시연구: 역사·사회·문화, 36 (2024), 89–118.

³ See Max Ritts, Kelsey Johnson, and Jonathan Peyton, “Canoes, Modernity, and the Colonial Imagining of Progress,” *GeoHumanities* 4:2 (2018), 481–503; British Museum, “Niabara - the Western Solomon Islands War Canoe at the British Museum: 3D Documentation, Virtual Reconstruction and Digital Repatriation,” accessed June 1, 2026, <https://www.britishmuseum.org/collection/galleries/niabara-western-solomon-islands-war-canoe>.

⁴ Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004).

⁵ Dong Yuting, “Red Brick Imperialism: How Vernacular Knowledge Shaped Japanese Colonial Expertise in Northeast China, 1905–45” *Technology and Culture* 63:1 (2022), 118–152.

⁶ Aaron Stephen Moore, *Constructing East Asia: Technology, Ideology, and Empire, 1875–1945* (Stanford, CA: Stanford University Press, 2013); Victor Seow, *Carbon Technocracy: Energy Regimes in Modern East Asia* (Chicago: University of Chicago Press, 2022).

⁷ Joseph A. Seeley, *Border of Water and Ice: The Yalu River and Japan’s Empire in Korea and Manchuria* (Ithaca, NY: Cornell University Press, 2024).

contested nature of the Yalu as an imperial frontier, his study treats timber-cutters primarily as borderland actors rather than as bearers of craft knowledge. This article complements Seeley's work by shifting the analytical focus from border-crossing to technology-making: examining how rafting techniques were classified, contested, and transformed within the colonial political economy of timber extraction.

Rafting on the Yalu River exemplifies this dynamic: far from a traditional mode of transport, it constituted a technological system deeply embedded in the riverine environment, the broader political economy of timber extraction and transport, and the practical knowledge of local laborers. Drawing on Chinese and Japanese forestry surveys and periodicals, diplomatic archives, and travel accounts, the article examines how the Yalu River Timber Company attempted to restructure the existing rafting system and how the categories of "Chinese-style rafts" and "Japanese-style rafts" were constructed and contested throughout this process. It argues that Japanese colonial enterprises actively deployed the language of "civilization" and "primitiveness" to legitimize the reorganization of local rafting practices, yet were unable to simply replace those practices, constrained by the late Qing regulatory framework mandating the exclusive hiring of Chinese laborers, the region's complex hydrological conditions, and the frontier production environment. Rather than a straightforward modernization, what emerged was a technological order characterized by coexistence and mutual adaptation, shaped by the interaction of colonial institutions, local knowledge, and the persistent craft practices of Chinese and Korean laborers, most concretely embodied in the synthesis of Japanese raft frames with Chinese steering rudders that Korean raftsmen produced through their daily navigation of both traditions. In tracing this process, the article reveals a central contradiction of colonial science and technology on the Yalu River: the craft techniques of Edo-period Japan, repackaged through colonial discourse as emblems of "civilization," came to stand as the very standard of modern technology within a rhetoric originally designed to disparage Chinese methods. Yet, despite being cast as opposites, the two were fundamentally similar as pre-industrial craft traditions: the very techniques deemed "civilized" differed from those deemed "primitive" far less than colonial discourse claimed.

Traditional Raft Construction and Raft Driving on the Yalu River

During the early Qing dynasty, the Changbai Mountains and the banks of the Yalu River were designated a protected zone—the "cradle of the ruling dynasty"—and strictly closed to economic exploitation. This prohibition left the region an unexploited, shared forest zone and transboundary waterway between China and

Chosŏn Korea.⁸ From the 1860s onward, shifting geopolitical pressures along the Northeast frontier prompted the Qing state to pivot from prohibition to taxation, gradually opening the region to managed timber extraction. In 1874, the court officially opened the territory east of the Willow Palisade, establishing tax bureaus at Dadonggou and Andong to regulate timber circulation; in 1877, the Fengtian Dongbian Military Circuit (Fengtian dongbian bingbeidao 奉天東邊兵備道) was instituted to oversee border defense alongside timber administration.⁹

Around 1880, the active implementation of the “moving people to support border areas” (*yimin shibian* 移民實邊) policy brought settlers into the region, and raft-building and driving techniques transmitted from the Yangtze River basin arrived during roughly the same period.¹⁰ The Yalu River basin was thus rapidly transformed from a secluded frontier forest into a dynamic zone where land reclamation and commercial exploitation proceeded hand in hand—with Dadonggou 大東溝 and Andong 安東 emerging as pivotal timber distribution hubs. It was within this expanding commercial system that the “timber laborer” (*muba* 木把) communities examined in this article took shape.¹¹

With the expansion of commercial forestry, the upper reaches of the Yalu River witnessed the rise of logging and transport communities organized around the *muba* system. The *mubas* were specialized laborers in the Qing-era Northeast China who engaged in logging, hauling, raft construction and raft driving. Most of them lacked independent capital and operated as dependents within larger logging concessions to execute specific tasks. In practice, these *mubas* were led into the mountains by labor contractors, commonly known as “logging headmen” (*batou* 把頭). Lumber firms (*liao-zhan* 料棧) typically financed these *batou* to indirectly orchestrate production, while certain well-capitalized *batou* managed to exert long-term control over relatively stable *muba* team.¹² The close relationship between *batou* and *muba*

⁸ Seonmin Kim, *Ginseng and Borderland: Territorial Boundaries and Political Relations Between Qing China and Choson Korea, 1636-1912* (Berkeley: University of California Press, 2017), 17.

⁹ Wang Changfu 王長富, *Economic History of Modern Forestry in Northeast China* 東北近代林業經濟史 (Beijing: Zhongguo linye chubanshe, 1991), 34–35.

¹⁰ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮·滿州·台灣林業發達史論 (Tokyo: Ōzora-sha, 1965), 216. I use Ogino Toshi's observation as a historical account of technological transmission rather than as an example of Japanese actors defining the situation on their own terms.

¹¹ Piao Shangchun 朴尚春, “Forest Resources and Predatory Logging in the Yalu and Hun River Valleys 鴨綠兩江的森林資源與掠奪性采伐,” in Dandong CPPCC Committee for Literature and Historical Materials 丹東政協文史資料委員會 ed, *Historical Source Materials of the Yalu River Basin* 鴨綠江流域歷史資料彙編, 2 vols (Dandong: Dandong wenshi chubanshe, 2007), vol.2, 538.

¹² Lü Si 呂斯, “Logger on the Yalu River 鴨綠江上的木把,” in *Historical Source Materials of the Yalu River Basin* 鴨綠江流域歷史資料彙編, vol.2, 648.

retained that of traditional guilds, characterized by Ogino Toshio as a “feudal... master-servant relationship.”¹³

On this basis, a timber extraction and transport system gradually took shape in the Yalu River basin, centered around the mutual coordination between liaozhan and muba communities. Because the high capital requirements of mountain logging and transport were prohibitive for independent batou, they relied heavily on these liaozhan for financial and material backing. The liaozhan not only advanced capital but also supplied daily provisions, formalizing terms for timber reclamation and profit-sharing through contractual agreements. Every autumn, financed by liaozhan based in Tianjin, Andong, and Dadonggou, batou would recruit migrant laborers from Shandong to enter the mountainous hinterlands for logging;¹⁴ the following summer, once the timber was rafted downstream to the markets, the liaozhan would centrally purchase the logs, deduct the principal and interest, and distribute the residual profits among the logging headmen and their crew members.¹⁵ This credit-based system not only sustained continuous timber extraction and transport, but also ensured that the knowledge and practices of timber work remained inseparable from the social structures of the muba community, embedded in relationships between batou, muba, and liaozhan rather than in any standardized or transferable form.

Timber extraction and transport exhibited a clearly seasonal pattern of operations.¹⁶ The batou were typically divided into two distinct supervisory roles: the mountain headmen (shanbatou 山把頭) and the chief raftsmen (maozi 卯子). The former directed mountain logging and overland transport, while the latter commanded waterborne transport. In early September each year, the shanbatou would venture into the mountains to survey timber distribution and transport conditions. To prevent encroachment by rival muba crews, they would “cut marks into roadside trees to establish ownership” over their designated logging areas. Subsequently, the muba would “collectively pack their rations and enter the mountains,” constructing roads and building shelters in preparation for logging operations. Once logging was complete, the timber was processed and bucked according to tree species, specifications, and market demand. During the winter, taking advantage of the ice and snow, the logs were relayed by human and animal draft power to be centrally stockpiled along the river systems. Concurrently, the logs were branded with the names and insignia of their respective muba collectives in

¹³ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論 (Tokyo: Ōzora-sha, 1965), 223.

¹⁴ Nōshōmushō Sanrinkyoku 農商務省山林局, *Report on Forest Survey in Manchuria* 満洲森林調査書 (Tokyo: Nōshōmushō Sanrinkyoku, 1906), 30.

¹⁵ Ministry of Agriculture and Commerce, Bureau of Forestry 農商務省山林局, *Yalu River Basin Forest Operations Survey Report* 鴨綠江流域森林作業調査復命書 (Tokyo: Ministry of Agriculture and Commerce, Bureau of Forestry, 1905), 24.

¹⁶ Also see Joseph A. Seeley, *Border of Water and Ice: The Yalu River and Japan's Empire in Korea and Manchuria*, 1–13, 34.

preparation for the next year's water transport.¹⁷ The scale of the labor force engaged in logging and rafting during this process was immense; each year, approximately 20,000 muba were active in the upper reaches of the Yalu River.¹⁸

The Yalu River thus constituted the primary transport artery for shipping Changbai Mountain timber to external markets. In 1904, Wei Zhen 魏震, an official of the Ministry of Works (Gongbu 工部), noted during his investigation of the Changbai Mountain forests that the timber produced in the southern valleys "must be rafted down the Yalu River, passing the riverbanks of Mao'ershan 帽兒山, and heading directly to Dadonggou." Similarly, Zhang Xiluan 張錫鑾, the Intendant of Dongbian Dao, described the zone stretching from the southwestern Changbai Mountains to Mao'ershan as a critical timber-producing region that "relied on the Yalu River as its transport route."¹⁹ The Yalu River thus served not only as the principal conduit for timber transport but as the spatial foundation within which the muba communities and techniques examined in this article developed.

Within the logging and rafting operations of the Yalu River forests, the waterborne transit phase was of paramount importance. Once timber entered the waterways, it was transported downstream primarily through two methods: loose driving (guanliu 管流) and raft driving (faliu 筏流). Guanliu, colloquially known as "driving the river" (ganhe 趕河) or "herding sheep" (ganyang 趕羊), referred to the practice during the spring thaw of "casting miscellaneous logs into the water and utilizing hydraulic power to let them drift downstream." Mubas would follow along the riverbanks or in dugouts, constantly clearing stranded timber to prevent jams.²⁰ Conversely, raft driving achieved organized downstream transport by binding the logs into timber rafts. Among these methods, the rafting system, founded upon raft construction and realized through raft driving, constituted the most representative traditional transport technology in the Yalu River basin.

Raft Construction

The structural features of traditional rafts were not arbitrary but shaped by the specific ecological and labor circumstances of the Yalu River, factors that would later prove central to understanding both the persistence of these practices and the limits of Japanese reform efforts. The construction of timber rafts typically commenced in April each year, following the spring thaw of the Yalu River. Initial

¹⁷ Ibid., 36.

¹⁸ Ibid., 29.

¹⁹ Wei Zhen 魏震, "Travel Diary of Southern Manchuria" 南滿洲旅行日記, in Editorial Board of Historical Materials of Modern Chinese History 中國社會科學院近代史研究所《近代史資料》編輯部 ed., *Historical Materials of Modern Chinese History* 近代史資料, 145, 121, 134.

²⁰ Wang Xuelai 王學來, "An Outline of the Sino-Japanese Joint Timber Company in Fengtian and Its Organization 奉天中日合辦採木公司事業之梗概及其組織," *The Eastern Miscellany* 東方雜誌 12:9 (1915), 41.

processing was first performed on the raw logs by the mubas, which entailed chiseling circular holes into both ends of each log, a practice colloquially known as eye-gouging (taoyan 掏眼).²¹ Subsequently, these logs were launched into the river to drift downstream, converging at designated rafting sites. During the actual assembly phase, sixteen or seventeen logs of equivalent length were aligned horizontally, interconnected by a long transverse pole colloquially termed “connecting rod” (chuanlian ganzi 穿連桿子), and secured by wooden wedges. This process formed the fundamental structural unit of the timber raft, known as a “raft section” (jiediao 截吊).²² Five such jiediao were linked longitudinally to constitute a raft bundle (pai 排), and several of these small rafts were further combined into a complete a timber raft (fa 筏).²³

Between the raft sections, fastening was achieved using “twisted wood” (nianmu 捻木) and wooden pegs. The nianmu was typically made from branches of Mongolian oak (*Quercus mongolica*), heated and then twisted and worked to increase flexibility and toughness, serving as a key connective material between individual sections.²⁴ This structure provided stability while retaining the necessary flexibility to accommodate variations in river currents. These rafts were further equipped with multiple steering rudders and featured specialized “flower sheds” (huapeng 花棚) for the muba’s lodging and rest, alongside “rice bins” (migui 米櫃) for grain storage, thereby enabling long-distance transportation and allowing the volumetric capacity of such rafts to exceed 400 shaku-jime (尺締)²⁵, a scale that, as later Japanese reformers would argue, rendered them unwieldy for efficient river navigation.²⁶

These structural features were intimately shaped by the hydrological conditions of the Yalu River. The heavily loaded, multi-tiered design provided stability in the deep, slow-moving waters of the middle and lower reaches, while the large steering rudders gave raftsmen control over the raft’s lateral movement in broader river channels. However, the same features that suited the lower reaches made them vulnerable during dry seasons. Taken together, these structural and hydrological entanglements illustrate why Japanese administrators found traditional rafting

²¹ Yalu River Timber Company 鴨綠江採木公司 ed., *Yalu River Forestry Chronicle* 鴨綠江林業誌 (Andong: Y Ōryōkō Saiboku Kōshi, 1919), 64.

²² *Ibid.*, 64.

²³ Wang Xuelai 王學來, “An Outline of the Sino-Japanese Joint Timber Company in Fengtian and Its Organization” 奉天中日合辦採木公司事業之梗概及其組織, *The Eastern Miscellany* 東方雜誌 12:9 (1915), 42.

²⁴ Yalu River Timber Company 鴨綠江採木公司 ed., *Yalu River Forestry Chronicle* 鴨綠江林業誌, 66.

²⁵ Shaku-jime 尺締 was a traditional Japanese timber-volume unit, equivalent to ten cubic shaku 立方尺.

²⁶ *Ibid.*, 66.

impossible to simply replace: the technology was inseparable from the ecological conditions that shaped it and the labor community that embodied it.

Raft Driving

The raft driving along the Yalu River were executed through a system of sectional assembly and navigation. In the upstream regions adjacent to the Heaven Lake of Mount Changbai, where the waterways were relatively narrow, muba working as raftsmen were required to construct small-scale rafts first. During Fukaya Shōtō's journey to the headwaters of the Yalu River, he once observed on the banks of the 19th Valley "the shadows of Chinese coolies busily assembling timber rafts." After these small rafts drifted downstream from the upper reaches, they were reassembled into large-scale timber rafts at Changbai Prefecture.²⁷ Before setting sail, the raftsmen would worship local water deities and the Dragon King at nearby shrines, praying for a smooth rafting voyage, before officially commencing the raft-driving operations. Generally speaking, each raft was manned by six to ten raftsmen, operating under the unified command of a maozi (see Figure 1). By virtue of his profound empirical knowledge of hydrological conditions, the maozi identified river channels, rapids, and shoals, and manipulated the steering oars to guide the timber raft past hazardous reefs. During the voyage, multiple rafts customarily traveled in fleets; in the event of grounding, the raftsmen would collaborate to clear obstructions, thereby maintaining the collective order of downstream transportation.²⁸

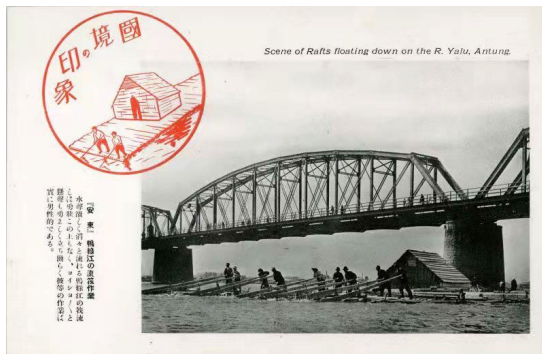


Figure 1. Traditional Chinese Raft. (Source) Postcard of a Traditional Chinese raft on the Yalu River, Main Library, Kyoto University, <https://rmda.kulib.kyoto-u.ac.jp/item/rb00030877>.

²⁷ Fukaya Shōtō 深谷松濤 and Furukawa Tekifū 古川狄風, *Survey and Exploration of Manchuria and Mongolia* 滿蒙探検記, 60–61.

²⁸ Yalu River Timber Company 鴨綠江採木公司 ed., *Yalu River Forestry Chronicle* 鴨綠江林業誌, 66.

As a specialized form of timber water transport, rafting was economically highly attractive. Due to the high technical difficulty and significant risks of rafting in the Yalu River basin, the income of raftsmen was generally higher than that of ordinary lumbermen.²⁹ According to the Japanese forestry expert Miyajima Takiro 宮島多喜郎, the cost of making a traditional timber raft was approximately 300 to 450 yen per raft, while upon arrival at Dadonggou each raft could be sold for 1,000 to 1,450 yen, yielding profits of several times the initial investment.³⁰ In addition, within the actual distribution system, ordinary raftsmen participating in transport could also obtain relatively substantial earnings. In 1902-1903, among the sixty-eight participants in the logging and transport operation that delivered eight rafts to Andong, the operation generated a total revenue of approximately 10,080 taels against total costs of 3,437 taels (equivalent to approximately 14,112 yen in revenue against 4,812 yen in costs, at the prevailing rate of 1 tael to 1 yen 40 sen). The forty-one profit-sharing laborers (guzi 股子) each received approximately 151 taels (about 211 yen) from the net profit, while the mountain labor headman (shan kuli tou 山苦力頭) received a double share plus an additional commission, totaling approximately 336 taels, and the remaining twenty-five wage laborers (rōgin 勞銀) received fixed wages separately. In the same year, among the twenty-four laborers who transported four rafts to Dadonggou, the sixteen profit-sharing laborers each received approximately 67 taels (about 94 yen) from a net profit of 1,084 taels, while the eight wage laborers received fixed wages calculated separately.³¹ The substantial returns available from rafting help explain both the vitality of the muba community and, as Hashiguchi Masami would later observe, their resistance to technological change: when traditional methods yielded such profits, the impetus for reform was difficult to generate.

²⁹ “Logging Operations on the Yalu River (Continued)” 鴨綠江に於ける作業機関（承前）, *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 330 (1910), 38.

³⁰ “Raft Transport on the Yalu River 鴨綠江上の筏業,” *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 241 (1902), 62. Note: 1 tael (liang) in Qing China was equivalent to 1 Japanese yen and 40 sen in gold currency, see Ministry of Agriculture and Commerce, Bureau of Forestry 農商務省山林局 ed., *Yalu River Basin Forest Operations Survey Report* 鴨綠江流域森林作業調査復命書, 65.

³¹ In the Andong case, the sixty-eight participants comprised twenty-five wage laborers (rōgin 勞銀), forty-one profit-sharing laborers (guzi 股子), one mountain labor headman (shan kuli tou 山苦力頭, equivalent to batou), and one household labor headman (jia kuli tou 家苦力頭) responsible for cooking and logistics. The household labor headman received a separate commission of 2% of the net profit rather than a share of the profit distribution. In the Dadonggou case, the mountain labor headman is included among the sixteen profit-sharing laborers. A household labor headman, who remained at the base camp to manage cooking and logistics, received a separate commission of 2.5% of the net profit and is not counted among the total participants. See Ministry of Agriculture and Commerce, Bureau of Forestry 農商務省山林局 ed., *Yalu River Basin Forest Operations Survey Report* 鴨綠江流域森林作業調査復命書, 87-90.

The rafting transport system on the Yalu River was highly sensitive to hydrological conditions, with transport duration fluctuating significantly according to both water levels and timber volume. During periods of low water, the journey from Ji'an 輯安 to Andong often took two to three months; by contrast, during high-water seasons, the downstream passage from Ji'an to Andong County could be completed in as little as five to six days.³² This instability also reflects the strongly seasonal character of timber transportation. Despite these constraints, the scale of timber exports in the Yalu River basin remained substantial. Before the Russo-Japanese War, approximately 610,000 logs were floated downstream annually from the upper reaches, with the number of rafts typically ranging between 3,000 and 4,000. Influenced by market demand and changing political circumstances, rafting activity also exhibited marked fluctuations: in 1901, driven by increased reconstruction demand following the Boxer Uprising, the number rose to 7,000 rafts; in 1903 it further increased to around 10,000; while in 1904, due to the military standoff of the Russo-Japanese War, rafting activity nearly came to a standstill.³³

In summary, the timber extraction and transportation system in the Yalu River basin constituted a composite structure jointly shaped by financial investment from lumber firms, organization by logging groups, and rafting operations. Within this structure, rafting technology did not exist as an independent domain; rather, it was closely intertwined with experiential labor and credit-based relations, thereby forming a relatively stable technological configuration that was difficult to alter. This characteristic, in turn, laid the groundwork for both the differentiation and persistence of rafting techniques under subsequent institutional transformations. This well-entrenched system of muba, batou, and liaozhan would soon face an external challenge, one that sought to displace it in the name of “civilized forestry” but ultimately succeeded only in reshaping it from without, leaving the deeper structures of Chinese rafting knowledge and labor intact.

The Making of “Chinese-style Rafts”: Colonial Discourse and Institutional Constraints on the Yalu River

Japanese ambitions on the Yalu River were undergirded by a well-established discourse linking forestry to national progress and civilization. As early as 1904, the Japanese forestry scholar Kawai Shitarō 河合鈺太郎 argued that forest management was a matter of national destiny, contrasting Britain and the United States—“nations renowned for their forestry”—with Qing China and Korea, whose depleted forests he associated with the decline of national vitality. Japan, as “the only progressive

³² Ibid., 36.

³³ Ibid., 64.

nation in the East,” he insisted, must pursue large-scale overseas forestry as a century-long enterprise.³⁴ This discourse carried an explicitly militaristic dimension: writing in May 1904 as Japanese forces advanced into Liaodong, Kawase Zentarō 川瀬善太郎 argued that timber reserves were more strategically important than precious metals for military supply, and that forestry should be understood as a form of military preparedness.³⁵ Acting on such imperatives, the Japanese Ministry of Agriculture and Commerce dispatched surveyors to Northeast China to assess timber resources and markets, producing reports that identified the Yalu River basin as a region of significant forestry potential.³⁶ Following the Portsmouth Treaty of 1905, Japan secured Russian concessions in southern Manchuria and, by December of the same year, had negotiated logging rights over the forests of the right bank of the Yalu River.³⁷

Prior to Japanese intervention, available descriptions of Yalu River rafting did not organize these practices through a national typology. A 1902 article titled “Rafting Industry on the Yalu River (Öryokkō-jō no ikadagyō 鴨綠江上の筏業) published in *Bulletin of the Great Japan Forestry Association* (*Dai-Nippon Sanrin Kaihō* 大日本山林會報) documented rafting operations on the Yalu River without any reference to any national classification, describing simply the practices of local Chinese raftsmen without distinguishing “Chinese-style” from “Japanese-style” methods. It was only after the Russo-Japanese War that Japanese forestry surveyors and military observers began documenting and comparing local and Japanese practices. The term “Chinese-style raft” (*Shina-shiki ikada* 支那筏) appears in Japanese sources as early as 1910, in Osaki Mineto 大崎峰登 survey *Conditions along the Yalu River Manchurian-Korean Border* (Öryokkō Mankan kokkyō jijō 鴨綠江滿韓國境事情), which notes the settlement of Singaül’p’a 新加乙坡, located approximately sixteen *ri* downstream from Hyesan on the Korean bank opposite China’s Shisandaogou 十三道溝, offered a gently sloping riverbank well-suited for mooring and capable of accommodating “fifty or more Chinese-style rafts.”³⁸ In the same year, Tsunashima Masakich 綱島政吉, a forestry official who participated in the Japanese military timber facility on the Yalu River from 1904 and later served

³⁴ Kawai Shitarō 河合鈺太郎, “Large-Scale Forestry Planning” 大規模の林業計画, *Journal of the Great Japan Forestry Association* 大日本山林會報, 259 (1904), 1–4.

³⁵ Kawase Zentarō 川瀬善太郎, “The Current Situation and Forestry” 時局と林業, *Journal of the Great Japan Forestry Association* 大日本山林會報, 258 (1904), 2–9.

³⁶ Ministry of Agriculture and Commerce, Bureau of Forestry 農商務省山林局, *Yalu River Basin Forest Operations Survey Report* 鴨綠江流域森林作業調査復命書, 27–28.

³⁷ Jilin Provincial Archives 吉林省档案馆 and Jilin Normal University Institute for Ancient Texts 吉林师范学院古籍研究所, eds., *Qingdai Minguo Jilin dang'an shiliao xuanbian: shewai jingji maoyi* 清代民国吉林档案史料选编·涉外经济贸易 (Changchun: Jilin Normal University Ancient Texts Press, 1995), 63.

³⁸ Osaki Mineto 大崎峰登, *Conditions along the Yalu River Manchurian-Korean Border* 鴨綠江滿韓國境事情, (Tokyo: Maruzen, 1910), 62.

with the Korean Forestry Bureau, provided a more detailed characterization, describing Chinese rafts as consisting of twenty logs bound together with hardwood pegs, equipped with four to six large steering rudders (*ōkai* 大櫂) at each end, and featuring on-raft shelters for the crew's lodging, a design that enabled long-distance transport but required eight to twelve raftsmen per vessel.³⁹

Japanese raftsmen first entered the Korean Peninsula and Northeast China during the Russo-Japanese War, consolidating their presence through the Korean Forestry Bureau (營林廠). In 1904-1905, when Japan went to war with Russia along the Yalu River, the Imperial Army urgently required timber for military infrastructure construction in the lower reaches. However, the only experienced hands available at the time were Chinese *muba*, who refused to cooperate with the Japanese military. As Tsunashima Masakich 綱島政吉, recorded: the *muba* "formed an alliance and obstructed our operations in every possible way," and "not a single experienced Chinese laborer, no matter how high the wage offered, was willing to work for us."⁴⁰ With no alternative, the military turned to recruiting raftsmen from the Japanese countryside. Raftsmen experienced in navigating swift river currents—recruited from the Yoshino area of Nara Prefecture and the Kiso River basin in central Japan—were dispatched to the upper reaches of the Yalu River to meet the military's timber demands.⁴¹ When the war ended, those who remained in service at the Japanese military timber facility were subsequently recruited by the Forestry Bureau of the Residency-General in Korea at Andong in May 1907, and later by the relocated Forestry Bureau (Eirinsho 營林廠) at Sinuiju in October 1908. From that point on, the annual recruitment of Japanese raftsmen from Nara, Wakayama, and Aichi prefectures became established practice, and incoming raftsmen also trained local Korean workers in what Japanese sources term "Japanese-style rafting techniques."⁴²

On the right bank of the Yalu River, Japan also sought to expand its control over the forests through a lumbering enterprise, but the process was far slower and more contested than on the Korean side. The newly established Company encountered an already well-entrenched traditional forestry system, sustained by Chinese *muba* and their accumulated craft knowledge. In September 1908, following several rounds of negotiations, the Sino-Japanese Yalu River Timber Company was formally established in Andong, securing Japanese control over timber concessions on the right bank of the Yalu River. However, unlike the Korean Forestry Bureau across the River, which actively recruited Japanese raftsmen and embraced their techniques,

³⁹ "Current Conditions of the Yalu River Forests (Continued)" 鴨綠江森林の現況 (承前), *Bulletin of the Great Japan Forestry Association* [大日本山林會報], 329 (1910), 20.

⁴⁰ *Ibid.*, 22.

⁴¹ "Forest Management along the Yalu River" 鴨綠江沿岸の森林経営, *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 295 (1907), 30.

⁴² "Logging Operations on the Yalu River (Continued)" 鴨綠江に於ける作業機関 (承前), *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 330 (1910), 37.

the Company was subject to explicit restrictions on the hiring of foreign laborers. Article 20 of the *Regulations of the Sino-Japanese Yalu River Timber Company* (Zhongri heban Yalüjiang muzhi gongsi zhangcheng 中日合辦鴨綠江木植公司章程), agreed upon by the Qing government and the Japanese Ministry of Foreign Affairs, reflected the Qing government's strategic concern for the livelihoods of frontier residents. It set explicit safeguards for local muba, mandating that:

“All laborers required for logging, transporting, constructing rafts, and driving rafts shall be exclusively recruited from among the Chinese, so as to protect the livelihoods of the local populace.”

It further stated,

“Should there be a necessity to concurrently employ foreign nationals, it shall be decided through consultation with and approval from the Director-General, in accordance with the provisions of the operational plan.”⁴³

Structurally, the Company's executive framework featured co-directors-general representing both sides. By 1910, Hashiguchi Masami 橋口正美 assumed office as the inaugural Japanese director-general, while Qian Heng 錢鏞 succeeded Hu Zongying 胡宗瀛 as Chinese co-director general. In other words, any employment of foreign raftsmen could only be initiated upon bilateral negotiations and mutual consent by Hashiguchi and Qian Heng, which the late Qing officials were consistently reluctant to approve. Under this framework, the only legally sanctioned agents of raft production and transport remained Chinese muba. The Late Qing officials participating in these negotiations might not have foreseen that this clause, originally intended to safeguard the muba livelihoods, would inadvertently serve as a legal bulwark that preserved traditional Chinese rafting craft against the encroachment of the so-called “civilized” Japanese technology.

Pursuant to the agreement, the Company was legally obligated to employ Chinese muba; yet it simultaneously sought to tighten control over these communities by directly advancing loans to batou. The Company established three branch offices in the upper reaches in Tonghua County, Linjiang (Mao'ershan), and Changbai County, giving rise to two cooperative models: the “loan-backed batou” (daijin batou 貸金把頭), which emulated the liaozhan custom of partnering with muba, and the “directly managed batou” (zhiying batou 直營把頭), who worked within the Company's proprietary logging concessions in Changbai County. Both models operated on identical financial terms, and both generated chronic debt pressure: during periods of depressed timber prices, logging revenues frequently fell short of

⁴³ Chen Rong 陈嵘, *Historical Materials on Forests in China* 中国森林史料 (Beijing: Zhongguo linye chubanshe, 1983), 67.

covering liabilities, binding batou and their teams to continued logging until debts were discharged, a dilemma that led the Company to place particular emphasis on “diligence and honesty” when selecting contractors.⁴⁴

The Company’s operational model thus relied less on technological displacement than on the integration of existing social structures into a corporate framework. With overall mechanization levels remaining low in Northeast China and the negotiated terms of the Company’s establishment guaranteeing Chinese muba their customary logging opportunities and credit access, the Company extended and reorganized the pre-existing muba and liaozhan system rather than supplanting it. This pattern of integration reflected a broader feature of the Yalu River timber industry: while mechanized sawmill equipment transformed timber processing on the riverbank, water-based operations proved far more resistant to industrialization. Rafting required embodied knowledge of river currents, seasonal hydrology, and terrain that could not be standardized or mechanically replicated. Technology, in this context, operated through people rather than in place of them.

Therefore, the Company’s integration of existing muba structures thus ensured the continued dominance of Chinese-style rafting on the right bank, producing a striking parallel coexistence of two distinct raft types on the same waterway. Following the Company’s incorporation in 1908 and the relocation of the Forestry Bureau to Sinuiju, timber descending from the upper reaches was spatially partitioned: the left bank fell under the Japanese-governed Korean Forestry Bureau, while the right bank came under the Company’s jurisdiction. This division sustained the parallel operation of two distinct technological systems—Chinese rafts, characterized by their flower sheds, heavily-loaded structure, and the traditional craft knowledge of local muba, alongside Japanese-style rafts—single-layered lightweight structures developed for the swift, rocky mountain rivers of Wakayama and Nara prefectures in Japan, and navigated by small crews recruited annually from those same regions (see Figure 2), and ensured that Chinese muba and their craft knowledge remained indispensable to the overall rafting system. From 1908 onward, Chinese *muba* were systematically excluded from raft making and raft driving operations within the Forestry Bureau’s jurisdiction on the left bank, confined instead to timber-logging in the mountains, a stark contrast to the right bank, where they remained the primary agents of timber transport.⁴⁵

⁴⁴ Yalu River Timber Company 鴨綠江採木公司 ed., *Yalu River Forestry Chronicle* 鴨綠江林業誌, 174.

⁴⁵ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論, 52.



Figure 2. Japanese-Style Raft. (Source) “Timber Rafting (Yalu River)” 流筏 (鴨綠江), in *East Asia Photography Album* 亜東印画輯, 12 (1941), 128.

Yet the Company’s pragmatic reliance on Chinese muba and their traditional methods sat uneasily with Japanese administrators, who were increasingly impatient with the persistence of Chinese-style rafting. Hashiguchi Masami 橋口正美, the Japanese Managing Director, framed the persistence of “Chinese-style rafts” as antithetical to “civilized forestry,” tracing their survival to deep-seated economic inertia: historically lucrative returns had stifled any impetus for technological innovation. In a 1911 address, Hashiguchi argued that historically, neither Chinese muba nor local entrepreneurs “entertained the slightest notion of reforming their logging and raft driving methodologies.” This inertia, he observed, persisted precisely because “both past and present, this enterprise has yielded such substantial profits that a mindset geared toward innovation never materialized.” Nevertheless, Hashiguchi warned that if operations were “blindly permitted to persist in these antiquated habits,” the profitability of the forestry sector would inevitably erode.

Consequently, he asserted that the Company was duty-bound to spearhead the reform of rafting technologies, framing such technological advancement as the inexorable evolutionary path aligned with “civilization” and “the spirit of the age,” a rhetoric that, as Hashiguchi made explicit in the same address, reflected not merely personal opinion but official Japanese policy: Japan’s overarching aim was “to help China advance toward civilization, so that it may stand alongside the great powers

of the world,” casting colonial intervention as benevolent guidance rather than extraction.⁴⁶

His disparagement extended beyond the technology to the laborers themselves. Regarding the “cheap labor” bound to Chinese-style rafts, he observed that “Chinese manual laborers are among the most resilient and powerful in the world,” and that among them, “muba are the most formidable,” men who, regardless of snow depth or bitter cold, “invariably venture into the mountains under the stars to fell and buck timber, returning to their crude shanties only when the moon has risen, toiling relentlessly from dawn to dusk.” Their standard of living, he noted, was so extraordinarily low as to be “nearing an animalistic state,” requiring merely three yen a month to subsist. What appears on the surface as grudging admiration was in fact a colonial calculus: Hashiguchi was not praising Chinese muba but pricing them—identifying their endurance and poverty as the very conditions that made Chinese-style rafting economically viable and therefore difficult to displace.⁴⁷

Writing in the same year, Tsunashima Masakichi offered a similarly dismissive assessment of Chinese rafting:

“In summary, the operational modalities of the Qing subjects remain distinctly primitive. At first glance, their methodology appears highly uneconomical; however, they compensate for these structural deficiencies by virtue of an exceptionally low labor cost and dogged endurance. Consequently, while their techniques require sweeping reforms and offer virtually nothing worthy of emulation from our perspective.”⁴⁸

Yet Tsunashima’s own observations undermined his dismissive verdict. Despite his claim that Chinese methods offered “nothing worthy of emulation,” he himself recorded that Korean raftsmen, exposed to both Chinese and Japanese rafting practices through daily interaction, had synthesized a “Sino-Japanese hybrid raft” (Nisshin setchū-ikada 日清折衷筏). Under Japanese institutional training, these laborers adopted the Japanese raft-binding technique during construction; yet when navigating the waterways, they discarded standard Japanese paddles in favor of the heavy rudder favored by Chinese raftsmen. Engineered for the robust double-layered Chinese raft, this rudder proved equally effective when deployed on the lighter Japanese-style frame.⁴⁹ The “Sino-Japanese hybrid raft” thus embodied what

⁴⁶ Hashiguchi Masami 橋口正美, “Forests of the Yalu River 鴨綠江の森林,” *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 347 (1911), 51, 53.

⁴⁷ Hashiguchi Masami 橋口正美, “Forests of the Yalu River 鴨綠江の森林,” *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 347 (1911), 50.

⁴⁸ “Logging Operations on the Yalu River (Continued)” 鴨綠江に於ける作業機関 (承前), *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 330 (1910), 21.

⁴⁹ *Ibid.*, 38.

colonial discourse could not accommodate: Chinese rafting knowledge was not being replaced but absorbed and transformed in the hands of Korean laborers.

This colonial discourse of civilization and primitiveness operated on two levels simultaneously: as an ideological justification for institutional reform, and as a framework that systematically obscured the complexity of what it sought to replace. By reducing an integrated system of craft knowledge, labor organization, and ecological adaptation to a national label of backwardness, Japanese administrators created the conditions for Murata Shigeharu's 村田重治 reform program of 1913, yet, as Tsunashima's own observation of the "Sino-Japanese hybrid raft" inadvertently revealed, the knowledge they sought to displace proved impossible to eradicate. It could only be absorbed, recombined, and rendered invisible within the very system designed to supersede it.

“Civilized Forestry” and Raft Reform on the Yalu River during the Republican Period

The fall of the Qing dynasty in 1911 removed the institutional barrier that had constrained Japanese ambitions on the Yalu River for long. With the regulatory framework mandating the exclusive employment of Chinese laborers now destabilized, Japanese administrators moved swiftly to advance the raft reform agenda that Hashiguchi and others had long advocated. Their motivation was at once economic and political: economically, the initial strategy was to introduce Japanese raftsmen to rationalize timber transport and reduce the inefficiencies associated with Chinese-style rafting; politically, control over rafting technology meant control over the labor of timber transport, breaking what Yoshida Shigeru would later call the Chinese laborers' "technical monopoly" over the Yalu River's most critical logistical operation. Murata Shigeharu 村田重治, a forestry doctorate and newly appointed Japanese Managing Director of the Company, emerged as the central advocate of this reform agenda. By August 1913, the question had reached the diplomatic level: Yoshida Shigeru 吉田茂, Japanese Consul in Andong, reported to Foreign Minister Makino Nobuaki 牧野伸顯 in support of large-scale adoption of Japanese-style rafts, arguing that their introduction was "an urgent necessity."⁵⁰

On October 10, Foreign Minister Makino wrote to Ochiai Kentarō 落合謙太郎, Japanese Consul-General in Fengtian, informing him that negotiations were underway with Zhang Xiluan 張錫鑾, the then Military Governor of Fengtian to bring to fruition the mandate, "repeatedly proposed by Managing Director Murata,

⁵⁰ Yoshida Shigeru, Japanese Consul in Andong, to Makino Nobuaki, 27 August 1913, "Concerning the Employment of Japanese Raftsmen at the Timber Company" 採木公司に於て日本筏夫雇傭に関する件, in "Yalu River Timber Company–Related Documents" 鴨綠江採木公司關係一件, Vol.14, JACAR Ref. B09040876400, Foreign Ministry Archives 外務省外交史料館.

to employ a minimum of thirty-two Japanese raftsmen.”⁵¹ On the same day, Minister Makino dispatched a letter to Consul Yoshida, indicating that the Chinese managing director of the Company had “agreed in principle,” and that consensus had also been reached with the Fengtian Governor. Makino cautioned, however, that despite the agreement at the upper echelons of the Chinese administration, concrete implementation required profound circumspection. He posited that the obstacles to introducing Japanese-style rafts “stemmed from the Chinese side’s groundless apprehensions regarding the outcome, or perhaps from certain sentimental attachments,” insisting that it was imperative to “transform their conceptual habits and propagate this measure throughout the entire Yalu River basin.”

Addressing the emergent resistance from the liaozhan and the muba, Makino directed that it be explicitly explained to both the Chinese directors and the local populace that the adoption of Japanese-style rafts would absolutely not usurp their livelihoods. He rhetorically argued that by “embracing this technology and achieving proficiency,” the local muba would not only see their earnings “more than double,” but that this shift was an inexorable necessity to meet “the inevitably surging demands for logging and afforestation in the future of Yalu River forestry.” To ultimately compel the Chinese to accept this new-style raft, the strategic plan was to initially deploy the “thirty-two Japanese raftsmen” to serve as a demonstrative vanguard.⁵² The push to introduce Japanese-style rafts was thus not merely a technical intervention but a carefully managed political and discursive operation, in which Japanese officials reframed local resistance as irrational sentiment while packaging colonial reform as economic opportunity for Chinese laborers.

During the loan negotiations, Fengtian Military Governor Zhang Xiluan submitted a borrowing request to the Japanese side, which seized the opportunity to press not only for the introduction of Japanese-style rafts but for broader forestry concessions. On 16 October, Murata wrote to Consul Yoshida, arguing that in technical matters such as forest surveying and raft transport, the Japanese side had long sought to “guide the Chinese side so as to prevent them from falling behind,” with the ultimate goal of executing “civilized forestry management.” Yet Chinese counterparts, in Murata’s characterization, remained “stubbornly conservative, rigidly bound by convention, and at times openly suspicious,” obstructing reform at every turn. On these grounds, Murata argued that Japan, possessing superior “scientific theory and rational management capacity,” should assume full decision-making authority over all technical matters. By recasting raft transport as a purely technical domain, Murata

⁵¹ Makino Nobuaki to Ochiai Kentarō, Japanese Consul-General in Fengtian, 10 October 1913, “Regarding the adoption of Japanese-style rafts by the Yalu River Timber Company” 鴨綠江採木公司に於て日本式筏採用に関する件, JACAR Ref. B09040876400, Foreign Ministry Archives 外務省外交史料館.

⁵² Makino Nobuaki to Yoshida Shigeru, 10 October 1913, “Regarding the Adoption of Japanese-Style Rafts by the Yalu River Lumber Company” 鴨綠江採木公司に於て日本式筏採用に関する件, JACAR Ref. B09040876400, Foreign Ministry Archives 外務省外交史料館.

effectively obscured its social dimensions: the livelihoods of local muba depended on precisely the practices he sought to displace.⁵³

On 21 October, Makino replied to Yoshida, endorsing Murata's proposal to leverage the Fengtian loan to reshape control over Yalu River forestry, including the expansion of the Company's exclusive logging zone, full Japanese jurisdiction over technical and accounting affairs, and the extension of operations into agriculture and animal husbandry. Crucially, Makino instructed that these objectives should not be pursued as formal Company policy but treated instead as a purely "special business matter," to be achieved by quietly inducing the Chinese managing director to make "internal concessions."⁵⁴ The colonial ambition was thus not only to expand Japanese authority, but to do so through the appearance of Chinese consent.

In November 1913, the Company formally presented to the Chinese side a proposal for reforming Chinese-style rafts on the Yalu River, accompanied by a report entitled "The Superiorities and Inferiorities of Japanese-style versus Chinese-style Rafts" (*Nihon-shiki ikada to Shina-shiki ikada no yūretsu* 日本式筏与支那式筏優之劣), preserved in the Fengtian warlord archives. The report systematically compared the two raft types and concluded that Japanese-style rafts better served the Company's goal of reducing production costs on the Yalu River.

The report systematized their case for raft reform around two axes: economic rationality and operational efficiency. On cost and labor, the single-layered Japanese raft required only one to two raftsmen and incurred markedly lower assembly and navigation fees, compared to the double-layered Chinese raft with on-raft shelters that demanded six or more laborers and far greater expenditure. On transit speed and throughput, the Japanese raft completed the Hyesan–Sinuiju run in seven to twelve days, enabling two to three roundtrips annually; the Chinese raft, constrained by its deeper draft and seasonal water dependency, took fifty or more days and yielded only one trip per year. Material utilization also favored the Japanese design: Chinese practice required dedicating a full log as an identification marker (*mu'erzi* 木耳子), stripping it of commercial value, whereas Japanese rafts used a corner incision that left the timber intact.⁵⁵ The report also conceded, however, that the Japanese raft's

⁵³ Murata Shigeharu to Yoshida Shigeru, 16 October 1913, "The reasons for placing the technical and accounting affairs of the company under the authority of the Japanese-side Managing Director" 公司ノ技術的事務及會計事務ヲ日本側理事長ノ権限トナス事トノ理由, JACAR Ref. B09040876400, Foreign Ministry Archives 外務省外交史料館.

⁵⁴ Makino Nobuaki to Yoshida Shigeru, 21 October 1913, "Regarding the Management of Agricultural and Pastoral Industries Incident to the Forestry of the Timber Company" 採木公司の林業附随農牧業の経営の件, JACAR Ref. B09040876400, Foreign Ministry Archives 外務省外交史料館.

⁵⁵ "Advantages and Disadvantages of Japanese-Style and Chinese-Style Rafts" 日本式筏與支那式筏優之劣, in Zhao Huanlin 趙煥林 and Liaoning Provincial Archives 遼寧省檔案館 eds, *Archives of the Fengtian Clique in the Republic of China: Volume for. 1913* 民國奉系軍閥檔案: 1913 年卷, 12 vols (Shenyang: Xian Zhuang shuju, 2016), vol.8, 34–55.

lighter frame was less durable, its scheduling advantage offset by the rule that raftsmen could not return until all timber was sold, and its reliance on Japanese expertise and Korean labor in the lower reaches introduced wage redundancies that inflated overhead costs.⁵⁶

The report's conclusion followed directly: since Japanese raftsmen commanded higher wages, the optimal strategy was to train Chinese laborers in Japanese-style construction and navigation, sustaining the technology at Chinese wage rates. The Korean Forestry Bureau's experience provided a precedent—rafting costs per shakujime had fallen steadily from 0.83 yen when Korean raftsmen were first trained, to 0.555 yen by 1911, 0.51 yen by 1912, and 0.485 yen by 1913.⁵⁷

In 1914, Murata Shigeharu formally launched a reform program targeting Chinese-style rafts, beginning with the Company's own directly operated (zhiying 直營) rafting division. The Company recruited Japanese raftsmen to work in the upper reaches of the Yalu River and selected between 300 and 500 Chinese and Korean raftsmen as trainees.⁵⁸ Concurrently, a portion of the directly operated rafts were converted into lightweight, single-layered Japanese-style rafts and floated downstream in the Japanese manner. By 1916, the Company announced the full conversion of its directly operated rafts to Japanese-style rafts. Beyond expanding the number of Japanese-style rafts, the Company also restructured the organization of rafting labor by separating raft construction from navigation and subcontracting each function independently, a marked departure from Chinese-style practice, in which the same crew was responsible for both building and piloting the raft. Finally, nineteen new mooring posts (xi fa mu zhuang 繫筏木樁) were established at successive points along the main channel and tributaries of the Yalu River to address logistical difficulties encountered during transit.⁵⁹

These structural reforms gradually took effect. Following the formal introduction of Japanese-style rafts into the Yalu River basin, a portion of Chinese raftsmen began adopting and mastering Japanese rafting technologies. By the late Taishō period (1925–1926), Chinese raftsmen had become capable of independently piloting Japanese-style timber rafts downstream; by 1930, the number of Chinese laborers skilled in both the binding and raft driving of these Japanese designs exceeded 700.⁶⁰ Concurrently, the geographical footprint of Japanese-style rafts expanded beyond the Yalu River basin into other river systems, with Japanese and Korean raftsmen

⁵⁶ Ibid., 57.

⁵⁷ Ibid., 60.

⁵⁸ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論, 220.

⁵⁹ “Ten Years of the Yalu River Timber Company (Continued)” 鴨綠江採木会社の十星霜（承前）, *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 427 (1918), 3–4, 15.

⁶⁰ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論, 235.

jointly operating Japanese-style rafts in the Second Songhua River basin from the winter of 1918.⁶¹

Yet this apparent triumph of Japanese-style rafting concealed a more complex reality. As Chinese and Korean raftsmen absorbed Japanese techniques through daily practice, they simultaneously retained and integrated elements of Chinese rafting craft. As Ogino Toshio later observed, Chinese-style rafts continued to dominate across the region until the Manchukuo period, when hybrid rafts finally became the prevailing form across all waterways. The “Japanese-style rafts” that eventually standardized timber transport across Northeast China were thus, in Ogino’s own words, hybrid crafts in which Chinese elements persisted.⁶² This article accepts Ogino’s characterization as historical evidence of the mixed nature of the rafts, while noting that his observation itself was made from within the same Japanese forestry establishment that had promoted the narrative of Japanese technological superiority, a reminder that even sympathetic observers remained embedded in the colonial knowledge system they were describing.

In a retrospective account published in 1918, Murata himself identified raft reform as one of the defining achievements of his tenure. He characterized the traditional Chinese-style raft as “extremely solid and heavy,” requiring seven or eight crew members to navigate downstream, with high assembly costs and prolonged transit times that caused timber to stall mid-river. Beginning in the Company’s sixth year (1914), he introduced Japanese-style rafts on a trial basis for a portion of the directly operated timber; by 1916, all directly operated timber was transported by Japanese-style rafts.⁶³

The competition and interaction between Chinese and Japanese-style rafts along the Yalu River exhibited several distinct characteristics. First, despite the active promotion of Japanese-style rafts, they did not entirely supplant their Chinese counterparts. However, as previously noted, “directly managed division” constituted only one of the company’s four operational sectors. Within the financed lumber firms (daijin liaozhan 貸金料棧) and financed labor contractors (daijin batou 貸金把頭) divisions, untrained Chinese raftsmen persisted, maintaining traditional Chinese methods of raft binding and raft driving.⁶⁴ In 1927, during a forestry inspection organized for the 36th convention of the Great Japan Forestry Association (Dai-Nippon Sanrinkai 大日本山林會) in Sinuiju, participating members documented the presence of “Chinese-style rafts” moored across the river in

⁶¹ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論, 272.

⁶² Ibid.

⁶³ “Ten Years of the Yalu River Timber Company (Continued)” 鴨綠江採木会社の十星霜（承前）, *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 426 (1918), 4.

⁶⁴ Ibid., 1.

Andong.⁶⁵ The observation underscores that Chinese-style rafts remained a vital logistical asset for the Company well into the late 1920s. This dual-track system persisted until the early years of Manchukuo, at which point, as Ogino Toshio observed, it was not pure Japanese-style rafts but hybrid crafts that came to dominate timber transport across Northeast China's waterways.⁶⁶

Second, beyond the practical competition on the river, the coexistence of Chinese- and Japanese-style rafts became a discursive battlefield: Japanese travelers and writers consistently mythologized Japanese-style rafts and their operators, producing a colonial narrative that linked Japanese rafting technology to notions of racial and civilizational superiority. For instance, in a Japanese article translated by Wei Shenghe (魏聲和) in 1918, the author remarked:

"The skill of raft driving can essentially be deemed a unique forte of the Japanese. To navigate a timber raft as massive as a giant whale with such absolute freedom, letting out a prolonged, melodious chant while drifting leisurely midstream, it leaves any onlooker thoroughly exhilarated. At the center of the raft, the Rising Sun flag flutters proudly."

"During my travels in Manchuria to survey the condition of our compatriots, I was frequently overcome with melancholy. Yet, arriving here at the Yalu River and contrasting the clumsy raft driving techniques retained by the Company with our own methods of raft driving, I cannot but marvel at the agility and skill of our raftsmen; it feels as though a chronic ailment has been instantly cured..... To claim that we Japanese lack a labor ethos is the gravest slander against our nation."

He further drew an explicit racial contrast: "The Han people, so resistant to change in their conservative ways, and the sharp, vigorous Yamato nation meeting on the Yalu River. What a perfect contrast they make!"⁶⁷

Evidently, the author was deeply dissatisfied with the Company's continued reliance on the Chinese-style raft driving. He criticized Chinese raft driving techniques as "clumsy" and lacking adaptive variations across different river segments, claiming that "the format remains identical regardless of whether it is the upper or middle reaches." This assertion, however, is demonstrably biased, as segmented navigation was equally an integral part of traditional Chinese raft driving. In the author's eyes, Japanese raft driving was epitomized purely by "skill and

⁶⁵ "Account of an Inspection Tour" 視察旅行記事, *Bulletin of the Great Japan Forestry Association* 大日本山林會報, 531 (1927), 107–108.

⁶⁶ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・滿州・台灣林業發達史論, 272.

⁶⁷ Wei Shenghe 魏聲和 and Zi Fengsheng 紫峰生 (trans.), "Transportation on the Yalu River" 鴨綠江之交通, *The Eastern Miscellany* 東方雜誌, 15:9 (1918), n. pag.

agility.” More egregiously, the writer equated the Chinese raft with a “conservative mindset” and the Japanese raft with being “sharp and vigorous,” thereby mythologizing Japanese technology and nationhood through the narrow, distorted lens of nationalist chauvinism.

This mythologizing tendency is equally evident in Fukaya Shōtō’s travelogue *Survey and Exploration of Manchuria and Mongolia*. In describing the moment when a Japanese-style raft, battered by powerful currents, struck a rocky cliff, Fukaya deliberately contrasted the two raft types:

“Even when struck by floodwaters against rocks, the Japanese rafts did not break apart. This was due to the ‘yosegi’ binding methods, which used strong, tightly joined timbers. Had it been a Chinese raft, it would not only have long since fallen to pieces, but might well have been reduced to splinters.”⁶⁸

The yosegi zaiku 寄木細工 method mentioned by Fukaya is a traditional marquetry craft native to the Kanagawa region of Japan. It demonstrates that, alongside the nejiki 捻木 binding method from the Kishū region, a technique in which twisted wood was used to connect raft sections and introduced to the Korean Forestry Bureau by Japanese raftsmen from Wakayama Prefecture, traditional craft techniques from Kanagawa also permeated the Korean Peninsula and Northeast China via Japanese raftsmen. In a colonial discourse calculated to disparage Chinese-style rafts, these traditional Japanese handicrafts, rooted in the regional craft traditions of Kishū and Kanagawa, were abruptly repackaged as emblems of “advanced” and “civilized” technology. The contradiction is pointed: the very rhetoric designed to condemn Chinese rafting tradition as backward simultaneously recast Japanese craft tradition as the embodiment of advancement.

Conclusion

The evolution of rafting technology along the Yalu River was by no means a linear displacement of the traditional rafting practices by the “civilized” technology. The long-term persistence of Chinese-style rafts stemmed largely from the late Qing government’s institutional arrangements during forestry negotiations: the regulatory mandate requiring the compulsory employment of Chinese muba became the primary structural barrier against the immediate displacement of Chinese rafts in the Company’s early years. In this sense, the Qing state’s deliberate efforts inadvertently shaped the technological trajectory of the entire rafting system.

⁶⁸ Fukaya Shōtō 深谷松濤 and Furukawa Tekifū 古川狄風, *Survey and Exploration of Manchuria and Mongolia* 滿蒙探検記, 125.

From the perspective of the history of rafting technology, techniques such as the nejiki binding and the yosegi-zaiku craft were fundamentally localized, traditional practices originating in Edo-period Japan. Engineered to adapt to Japan's unique pre-industrial geography and hydrology, these methods of raft binding and raft driving inherently carried localized specificities and limitations. Yet, within the historical context of Japanese colonial expansion into Korea and Northeast China during the late Qing and early Republican eras, these regional handicrafts were reframed and promoted as exemplars of "advanced" and "civilized" rafting technologies, a status subsequently leveraged to legitimize the overhaul of the Yalu River rafting industry. The derogatory Japanese assessments of Chinese-style rafts thus illuminate a specific apparatus of colonial knowledge production, one that systematically coded Japanese practices as inherently "progressive" while pathologizing local techniques as "primitive" and "conservative."

As Ogino Toshio observed, the "Japanese-style rafts" that eventually dominated Northeast China's waterways were in essence hybrid crafts, incorporating Chinese elements that had proved impossible to eradicate, a synthesis embodied most concretely in the practices of Korean raftsmen who, exposed to both traditions, combined Japanese binding techniques with Chinese steering rudders.⁶⁹ The history of rafting technology on the Yalu River thus returns us to the making of Sino-Japanese hybrid raft itself: the categories that Japanese sources coined to legitimate their intervention exposed their own contradictions, for the "civilized" technology they promoted was rooted in Edo-period craft traditions, while the "primitive" practices they sought to displace proved inseparable from the labor and ecological knowledge that sustained the entire system. In fact, the nejiki binding method and yosegi zaiku craft promoted as emblems of Japanese civilization shared a fundamental characteristic with the Chinese-style rafting they sought to displace: both were pre-industrial, regionally specific craft traditions deeply embedded in local labor communities and ecological conditions.

⁶⁹ Ogino Toshio 萩野敏雄, *The Historical Development of Forestry in Korea, Manchuria, and Taiwan* 朝鮮・満州・台湾林業発達史論, 167.

Abstract

When the Sino-Japanese Yalu River Timber Company launched its rafting reform program in the early twentieth century, Japanese administrators framed Japanese-style rafts as a triumph of civilized forestry management over Chinese backwardness. Yet the outcome was neither straightforward replacement nor simple modernization. The late Qing regulatory framework mandating the exclusive hiring of Chinese laborers provided a structural barrier that delayed Japanese intervention and sustained reliance on local rafting knowledge. Drawing on Japanese diplomatic archives, forestry surveys, and travel accounts, this article argues that the apparent victory of Japanese-style rafts concealed the persistence and transformation of Chinese rafting practices. First, the categories of “Chinese-style” and “Japanese-style” rafts were themselves coined by Japanese sources after the Russo-Japanese War: before Japanese intervention, no such classificatory distinction existed on the Yalu River. Second, the contradiction at the heart of this discourse: the “civilized” technology being promoted was itself rooted in Edo-period craft traditions, Japanese regional handicrafts that shared the same pre-industrial character as the practices they sought to displace, repackaged through colonial discourse as emblems of “civilization.” Third, Chinese-style rafting was never fully displaced: what emerged was a technological order of coexistence and mutual adaptation, in which Chinese techniques, labor structures, and ecological knowledge persisted within and shaped the reformed system, most concretely embodied by the synthesis of Japanese binding techniques with Chinese steering rudders that emerged through daily practice. Together, these findings suggest that colonial science and technology on the Yalu River operated not by replacing local knowledge but by reclassifying, absorbing and obscuring it.

Keywords: timber rafting; Yalu River; colonial forestry; Chinese-style raft; technology transfer; colonial discourse