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Acceleration in a time of war: Technology, nation, and ecology in the South China Sea, 1956–66

Gerard Sasges

On the eve of its foundation in 1954, the Republic of Vietnam had five motorised fishing boats; 20 years later, that figure had swelled to over sixty thousand. This conversion to fossil fuels, along with associated developments like the intensified exploitation of marine ecologies and the use of new synthetic materials, form part of what has come to be called the 'Great Acceleration'. This article follows a Japanese fisheries expert who spent six years in Vietnam in the early 1960s to explore the physical and conceptual work this process entailed, its entanglement with projects of war-making and nation-building, and the way it was both a product of and producer of the collapse of local ecologies.

The tarmac was probably wet from a rainy-season storm as Soichi Kaneko emerged from the Air Vietnam Super Constellation after his long flight from Hong Kong.[1] It was a humid evening in July 1960, and his shirt must have been soaked with sweat before he'd made it even halfway across the apron to the newly-completed civilian arrivals terminal. Tân Sơn Nhứt had yet to be transformed into one of the world's busiest airports by a deepening civil war and the full force of American intervention, and as Kaneko collected his bags and made his way through Immigration and Customs, he might have imagined that this was just another short-term consulting assignment in a developing Asian nation like any other.

Gerard Sasges is Associate Professor in the Department of Southeast Asian Studies, National University of Singapore. Correspondence in connection with this article may be addressed to gerard.sasges@nus.edu.sg. He would like to thank all the participants in the 2018 workshop 'Southeast Asian Natures: Environmentalism and the Anthropocene in Southeast Asia', and in particular the workshop organisers, David Biggs, Christina Schwenkel and Hendrik Maier, along with the *JSEAS* editors and reviewers. Their commentary, criticism, and collegiality have made an immense contribution to the present article. Finally, he would like to thank Tim Amos for his help tracing Soichi Kaneko's early career and for his reflections on Japanese ideas of nature. Research for this article was made possible by the MOE Academic Research Fund Tier 1 Grant R R-117-000-048-115 and the institutional support of the University of Social Sciences and Humanities in Ho Chi Minh City.

1 Reflecting their own orthography, Vietnamese translated Kaneko's given name as 'Soichi'; a typical rendering in English would be 'Shoichi'. In the interests of clarity, this article will follow the Vietnamese orthography throughout. All of Kaneko's reports are contained in a single voluminous file held in the Vietnam National Archives 2 in Ho Chi Minh City (hereafter VNA2), Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko–chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966. In the references, homologous terms like 'Rapport technique' or 'Báo cáo kỹ thuật' are reproduced in the language they appear in the archive, and can shift according to when and for whom the document was produced. Translations are the author's own.

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Kaneko was one of more than a dozen Japanese experts who worked for the imaginatively named 'United States Consultants, Inc.' that administered a fisheries development project in the Republic of Vietnam (RVN) between 1956 and 1966. It was a multifaceted project involving experts not just in fields like ship design, marine engines, and fishing tackle, but also in subjects like maritime training, aquaculture, refrigeration, and commerce.[2] Most of his colleagues stayed a year or two at most. But Kaneko ended up spending the next six years in the RVN, engaging with fishers up and down its coast, developing expertise, adapting and demonstrating new practices and technologies, and playing a central role in the development of the nation's commercial fisheries.

The work that Kaneko and his Vietnamese and Japanese colleagues carried out between 1956 and 1966 was the basis of a remarkable transformation of the RVN's fisheries in the years that followed.[3] Few statistics capture the scale of the change better than this one: on the eve of its foundation in 1954, the RVN had five motorised fishing boats; twenty years later, there were well over sixty thousand motorised fishing boats plying the waters off the coast, or almost two-thirds of the total fleet.[4] Along with the motorisation of the RVN's fishing fleet came other momentous changes: new fishing gear and techniques, expanded ports and markets, ice factories and canneries, and commercial aquaculture. As the RVN's fishing fleet converted to marine engines, adopted new techniques, and exploited new ecologies, catches rose dramatically; from 380,500 tons in 1966, fish landings had risen to 677,720 tons in 1972 and were set to reach more than 1 million in 1974.[5]

If we evaluate the RVN's fisheries modernisation programme in its own terms of increased fish landings, more protein in local diets, and foreign currency earnings from exports to markets like Singapore and Japan, it was a remarkable success. Moreover, the modernising fleet was a potent symbol of the nation's progress, not to mention an effective means of asserting sovereignty over the nation's coasts and projecting it ever farther into the South China Sea. Success is not a word we normally associate with the short-lived Republic of Vietnam. Well-known nation-building programmes such as Land Reform, Agrovilles, or Strategic Hamlets are usually understood within a larger arc of failure predicated on the regime's end in 1975.[6] Yet

2 For the early work of Japanese consultants see VNA2, Phủ Tổng thống Đệ nhất Cộng hòa (1954–63), Hồ sơ số 12823: Báo cáo hoạt động năm 1959 của chuyên viên Nhật tại Nha Ngư nghiệp.

3 This transformation was noted by contemporaries. See Tony Loftas, 'Fisheries boom for South Vietnam?', *New Scientist* 46, 700 (1970): 280–83.

4 For the fishing fleet in 1954 see VNA2, Nha Ngư nghiệp, Hồ sơ số 42: Tờ trình niên để 1969 về hoạt động của Nhà Ngư Nghiệp, 'Tờ trình năm 1969 của Nha Ngư nghiệp và Sở Hải Dương học'. For 1974, see VNA2, Nha Ngư nghiệp, Hồ sơ số 68: Chương trình phát triển ngư nghiệp 1974, 'Chương trình, báo cáo hoạt động năm 1974 của Nha ngư Nghiệp'.

5 The first three-quarters of 1974 alone saw 813,120 tons of fish landed. Statistics from 1966 from VNA2, Nha Ngư nghiệp, Hồ sơ số 16: Tờ trình hiên để 1967 về hoạt động của Nha Ngư Nghiệp, 'Tờ trình hoạt động năm 1967 của nha Ngư nghiệp', Statistics from 1972 and 1974 from VNA2, Nha Ngư nghiệp, Hồ sơ số 68: Chương trình phát triển ngư nghiệp 1974, 'Chương trình, báo cáo hoạt động năm 1974 của Nha ngư Nghiệp'. These figures are all the more impressive when we consider how the deepening war after 1965 had rendered large swathes of the RVN's seas off-limits to fishers. In 1974, for example, a third of territorial waters were closed off completely to non-military traffic and another third were closed for night fishing.

6 For example, see the treatment of the RVN's Strategic Hamlet Program in Michael Latham,

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shifting perspective from the land to the water and from American-led projects to one where Japanese experts worked together with Vietnamese tells a story of success, even if it was qualified in important ways.

Multiple factors contributed to the modernisation of the RVN's commercial fisheries. Much of it flowed from the hard work and determination of Vietnamese fishers themselves, who were quick to see the potential of technologies and materials that could be easily integrated into existing practices. The work of men like Kaneko and his Vietnamese colleague Nguyễn Vĩnh Bảo was important too, as they patiently studied, adapted, demonstrated, and taught in towns and villages up and down the coast of central and southern Vietnam. Fisheries development reflected Japanese as much as Vietnamese interests: at the same time they helped build state capacity and modernise a key sector of the economy, experts like Kaneko also conducted valuable research on the fishing resources of the South China Sea, directed Vietnamese fish products to Japanese markets, and promoted sales of Japanese-made Kuralon nylon and Yanmar marine engines. A final factor was the way doctrines of fisheries development that had underpinned Japanese imperial expansion prior to the Second World War responded to the concerns of Vietnamese officials engaged in an increasingly desperate struggle to build a nation and secure its territories. The result was a practice of fisheries development that not just eschewed conservation, but embraced ecological destruction as a necessary precursor to development. Yet whatever its effects on local and global ecologies, the RVN's programme of fisheries modernisation was a success on its own developmentalist terms. And it was a success that helped to build a nation at the same time it tied that nation to Japanese institutions, markets, and industries.

This is more than a story of modernisation and development and the lingering effects of Japanese imperialism, however. It is also a story of the 'Great Acceleration' of the rate of impact of human activity upon the Earth's ecosystems since the end of the Second World War.[7] As Vietnamese fishers replaced sails with marine engines, exchanged ramie, silk, and wood for nylon and plastic, and modified coastal environments to facilitate commercial aquaculture, they were drawn irrevocably into global processes of ecosystems change.[8]

Modernization as ideology: American social science and 'nation building' in the Kennedy era (Chapel Hill: University of North Carolina Press, 2000), pp. 151–208. Even more sympathetic accounts still tend to describe such initiatives as failures. David Biggs, for example, attributes the failure of irrigation projects in the Mekong Delta to the inability of Vietnamese and American officials to escape understandings of the human and natural environment with roots in the colonial period. D. Biggs, 'Breaking from the colonial mold: Water engineering and the failure of nation-building in the Plain of Reeds, Vietnam', *Technology and Culture* 49, 3 (2008): 599–623. See also Geoffrey C. Stewart, *Vietnam's lost revolution: Ngo Dinh Diem's failure to build an independent nation, 1955–1963* (Cambridge: Cambridge University Press, 2017); Philip E. Catton, *Diem's final failure: Prelude to America's war in Vietnam* (Lawrence: University Press of Kansas, 2002).

7 John Robert McNeill, *The Great Acceleration: An environmental history of the Anthropocene since 1945* (Cambridge, MA: Harvard University Press, 2014); J.R. McNeill, *Something new under the sun: An environmental history of the twentieth-century world* (New York: Norton, 2001).

8 The International Geosphere-Biosphere Programme has quantified human impact on earth systems by analysing data in two broad categories of 12 subcategories each. For the purposes of this article, one immediately relevant socioeconomic trend is primary energy use, while earth trends include marine

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In the Republic of Vietnam, this accelerating impact was inseparable from war. In recent years, scholars have begun to highlight the interaction of war and the environment.[9] Studies of the impact of war on marine environments are few, however, and even fewer make an explicit connection between war and the Great Acceleration.[10] The transformation of the Vietnamese fishing fleet after 1956 was undeniably hampered by a war that disrupted transportation and commerce and diverted human and natural resources to military ends. At the same time, however, Vietnamese attitudes towards the environment were conditioned by the knowledge that the nation was engaged in a desperate struggle for survival. In this context of war, inshore and nearshore fisheries could become not just collateral damage, but rather the necessary victims of an ecological revolution. In this way, the figure of Soichi Kaneko allows us to see how the Great Acceleration came to the RVN's fisheries, to understand the work — physical and conceptual — that this seemingly ineluctable process entailed, its entanglement with projects of war-making and nation-building, and the way it was both a product of and producer of the collapse of local ecologies.

Rich fisheries, strong army

After graduation from the Fisheries University of Tokyo in the 1930s, Soichi Kaneko's first job was with the major marine products company, Nippon Suisan (often referred to as Nissui). Thus, by training as well as by his early work experience, he was a builder of what William Tsutsui has called a 'Pelagic Empire'.[11] From the early days of Meiji, fisheries had been seen as central to the expansion and consolidation of an empire that was as much oceanic as it was terrestrial. In the Social Darwinist-inflected thinking of Japanese intellectuals and policymakers, national survival required taking control of the ocean and exploiting it rationally if not ruthlessly.[12] By the late nineteenth century, for Japanese officials 'the ocean appeared as a set of developable places that sovereign states could dominate and harness using modern science and technology. Fisheries management was a rational, modernist body of knowledge about the environment that enabled the nation to build up its

fish capture and shrimp aquaculture. See http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html (accessed 29 Sept. 2018).

9 A seminal work is Richard P. Tucker and Edmund Russell, eds., *Natural enemy, natural ally: Toward an environmental history of war* (Corvallis: Oregon State University Press, 2004). For war and the environment in Asia, see David Biggs, *Quagmire: Nation-building and nature in the Mekong Delta* (Seattle: University of Washington Press, 2010); Micah Muscolino, *The ecology of war in China: Henan Province, the Yellow River, and beyond, 1938–1950* (New York: Cambridge University Press, 2015).

10 When war is mentioned in relation to fisheries, it is primarily in terms of the respite the Second World War provided for fish stocks to recover before a period of rapidly intensifying exploitation after the war's end. See for example John Butcher's *The closing of the frontier: A history of the marine fisheries of Southeast Asia c. 1850–2000* (Singapore: Institute of Southeast Asian Studies, 2004). One exception is Poul Holm, who highlights how the Second World War drove a reassessment of ocean resource policies, reoriented markets, and produced new technologies that could be applied to commercial fishing. P. Holm, 'World War II and the "Great Acceleration" of North Atlantic fisheries', *Global Environment* 10 (2012): 66–91.

11 William M. Tsutsui, 'The Pelagic Empire: Reconsidering Japanese expansion', in *Japan at nature's edge: The environmental context of a global power*, ed. Jared Miller, Julia Adeney Thomas and Brett Walker (Honolulu: University of Hawai'i Press, 2013), p. 26.

12 Julia Adeney Thomas, *Reconfiguring modernity: Concepts of nature in Japanese political ideology* (Berkeley: University of California Press, 2001).

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geopolitical power at the expense of others'.[13] The Meiji state quickly became involved in the promotion of offshore fisheries by creating institutions, funding research, employing experts, and subsidising fishers and fishing companies. Fisheries development was thus an integral part of the larger social, technological, and economic, and military project summarised in the slogan of 'Rich Nation Strong Army'.[14]

State intervention contributed to the rapid growth in offshore fishing by Japanese fishers in the early twentieth century. But the more extensive exploitation of marine resources was also a response to the collapse of Japan's inshore and nearshore fisheries caused by more intensive exploitation and the use of new technologies. The geographic expansion of Japanese fisheries would mirror, and in some cases precede, formal imperial control over places like Korea, Formosa, and Manchuria. The waters of Southeast Asia were another. By the 1920s, Japanese fishers were actively plying the waters of the region. Some provided fresh fish to the markets of Saigon, Singapore, and Batavia.[15] Others landed their catches in Formosa and the Japanese home islands. Taken together, the activities of Japanese fishers provoked colonial officials to make alarmed reports of decimated fish stocks and calls for the protection of the region's marine resources.[16]

The War in the Pacific for a time created an opportunity for Japanese officials to intervene more directly in the management of fisheries in Southeast Asia in general and Vietnam in particular. After 1941, two Japanese fisheries research vessels were sent to study waters off the coast of Vietnam while others operated in the Gulf of Thailand, and in 1941–42, a major mission including seven fisheries experts carried out a comprehensive survey of Indochina's natural resources.[17] Although they derided the undeveloped state of Indochina's commercial fisheries, they noted that production nonetheless far outstripped that of other nations in the region and highlighted their potential importance for the Imperial economy. They recommended major new investment, with large motorised bottom trawlers to be based in Hải Phòng and Saigon, mid-water trawlers in Phan Rang, Cam Ranh, and Nha Trang, and the construction of ice plants and refrigerated storage sheds in all major fishing ports. These were ambitious plans for 1942, and Japanese planners were hampered equally by the need to work through French administrative structures and by the turning tide of the war in the Pacific.

We don't know if Kaneko was one of the fisheries experts who accompanied the fact-finding mission to Indochina in 1941, or if he was involved in the drafting of its

13 Micah Muscolino, 'Fisheries build up the nation: Maritime environmental encounters between Japan and China', in Miller et al., *Japan at nature's edge*, p. 57.

14 See Richard J. Samuels, *'Rich nation, strong army': National security and the technological transformation of Japan* (Ithaca, NY: Cornell University Press, 1994).

15 See Anthony Medrano, 'The edible tide: How estuaries and migrants transformed the Straits of Melaka, 1870–1940', in this issue, and Hiroshi Shimizu, 'The Japanese fisheries based in Singapore, 1892–1945', *Journal of Southeast Asian Studies* 28, 2 (1997): 324–44.

16 Pierre Chevey, *Rapport sur le fonctionnement de l'Institut Océanographique de l'Indochine pendant l'année 1931–1932* (Saigon: Gouvernement General de l'Indochine, 1932).

17 On the research vessels, see VNA2, Nha Ngư nghiệp, Hồ sơ số 4: Tờ trình của nhân viên Nha Ngư nghiệp về cuộc khảo sát ngư nghiệp tại Nhật Bản và Hồng Kông'. On the Japanese research mission, see Le Manh Hung, *The impact of World War II on the economy of Vietnam 1939–1945* (Singapore: Marshall Cavendish, 2004), pp. 162–4.

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recommendations. We do know that he spent the war working in the Imperial department set up to oversee the exploitation of its fisheries. After 1947, when American policymakers made a prosperous Japan the cornerstone of the Cold War strategy in Asia, he was one of thousands of former Imperial officials, engineers, and technicians who were transformed into international experts.[18] Through international consultancies and nongovernmental organisations like UNESCO, the UNDP, the FAO, and the IOC, Japanese would play a key and often underappreciated role in elaborating postcolonial networks of transnational knowledge circulation in Asia. Subjectively, they were perceived as more flexible and culturally better suited to dealing with their fellow Asians.[19] And in practical terms, Japanese fisheries experts had regional experience and practical expertise unavailable to most Westerners.[20] For example, Kaneko's supervisor at the Fisheries University of Tokyo, Takayama Shigene, would serve as the Japanese representative to the FAO in the 1960s. And in Vietnam, his student would find work with United States Consultants, Inc.

In many ways, Kaneko and his fellow consultants resembled the experts who designed and implemented projects of the sort explored by James Scott in his classic *Seeing like a State*. Their development plans were predicated on a belief that technology held the answers to problems often defined by the technology itself, and depended on statistics and models that imposed a reductionist 'grid of intelligibility' on the natural world.[21] This developmentalist vision intersected with the needs of the new Republic to engage in a kind of 'anti-politics' as it removed questions about the allocation and use of resources from the realm of politics and replaced them in the realm of 'technology' and 'development' in ways they hoped would enhance control over

18 Donna C. Mehos and Suzanne M. Moon, 'The uses of portability: Circulating experts in the technopolitics of Cold War and decolonization', in *Entangled geographies: Empire and technopolitics in the global Cold War*, ed. Gabrielle Hecht (Cambridge, MA: MIT Press, 2011). Biggs also points to the role of former colonial and imperial officials in the RVN in David Biggs, 'Reclamation nations: The U.S. Bureau of Reclamation's role in water management and nation building in the Mekong Valley, 1945–1975', *Comparative Technology Transfer and Society* 4, 3 (2006): 230. For Japanese participation in post-war development in Southeast Asia, see Aaron Moore, 'Japanese development consultancies and postcolonial power in Southeast Asia: The case of Burma's Balu Chaung Hydropower Project', *East Asian Science, Technology and Society* 8, 3 (2014): 297–322.

19 Such thinking would see Japanese fisheries experts joined by Korean and Taiwanese in the mid-1960s. See VNA2, Nha Ngư nghiệp, Hồ sơ số 16: Tờ trình hiên đễ 1967 về hoạt động của Nha Ngư Nghiệp, 'Tờ trình hoạt động năm 1967 của nha Ngư nghiệp'. One exception in Southeast Asia was Thailand, where German experts played an important role in modernising the fishing fleet in the 1960s. See Franziska Torma, 'Environment and development: West-German fisheries experts in Thailand', paper presented at the conference of the European Society for Environmental History, Munich, 20–25 Aug. 2013.

20 The exception, of course, is former colonial officials. The last French director of the Indochinese Oceanographic Institute, Raoul Serène, for example, continued to play an important role in marine science and fisheries development in the region after 1955 through his employment with the United Nations and other international development agencies. See Jacques Forest's sketch of his career in *Crustaceana* 43, 2 (1982): 189–200.

21 James C. Scott, *Seeing like a State: How certain schemes to improve the human condition have failed* (New Haven, CT: Yale University Press, 1998). For fisheries, see Jennifer Hubbard, 'In the wake of politics: The political and economic construction of fisheries biology, 1860–1970', *Isis* 105, 2 (2014): 364–78; Tim D. Smith, *Scaling fisheries: The science of measuring the effects of fishing, 1855–1955* (Cambridge: Cambridge University Press, 1994).

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politically suspect and frequently unruly populations.[22] And yet the consultants brought with them a peculiarly Japanese vision of fisheries development as a dialectic of technological change and ecological collapse inseparable from issues of security, territorial expansion and consolidation, and war.

Translating fisheries development

In the RVN, Japanese fisheries development doctrines would be transposed from this context of imperial contest to that of a life and death struggle to build a viable, modern, and non-communist state south of the 17th parallel. Founded just nine months prior to the launch of the fisheries development project, the new state faced considerable challenges: establishing central authority, rebuilding after a devastating war, resettling almost a million refugees, increasing living standards, and demonstrating the superiority of a non-communist path to development. At their most realistic, local policymakers saw the project as a way to increase animal-derived protein in local diets at the same time as fisheries exports provided a source of valuable foreign exchange. At their most ambitious, they saw the modernisation of the fishing fleet as a counterpart to programmes of land reform and rural development. Fisheries development was thus part of a larger sociopolitical project that would not just rebuild, but revolutionise the republic's economy and society, drive the transition from an agrarian to an industrialised consumer society, and allow the RVN to join the ranks of developed nations. Fisheries development would create jobs, trigger the development of transportation and commercial infrastructure, and demonstrate the wisdom of following a non-Communist path to development.

At the same time, fisheries development in the RVN was inseparable from issues of security and sovereignty. The new fisheries offices that sprouted along the Vietnamese coast, the training courses they provided, and the aid programmes they administered created a state presence where little or none had existed before.[23] The registration and surveillance of fishing boats was an essential part of responding to the very real threat of infiltration and attack by the enemy to the north. And a developing discourse of territorial waters and fisheries management would be made real by a motorised fishing fleet able to contest the exploitation of the nation's marine resources by 'foreign vessels' and to project RVN sovereignty ever further from its shores.[24] The creation of an independent Bureau of Fisheries under the Ministry of Public Works and Transportation in 1955, and the arrival of the first Japanese

22 James Ferguson, *The anti-politics machine: 'Development', depoliticization and bureaucratic power in Lesotho* (Cambridge: Cambridge University Press, 1990).

23 For the tenuous and uneven reach of the colonial administration, see Gerard Sasges, *Imperial intoxication: Alcohol and the making of colonial Indochina* (Honolulu: University of Hawai'i Press, 2017), pp. 71–97.

24 In 1967 Bureau of Fisheries Director Trí described how incursions by foreign fishing vessels were 'occurring continuously and becoming more frequent with each passing day in the waters around Nha Trang, Phan Thiet, and the Gulf of Thailand'. VNA2, Nha Ngư nghiệp, Hồ sơ số 517: Tài liệu của Nha Ngư nghiệp về khảo sát phát triển ngư nghiệp viễn duyên và xuất bản sách về ngư nghiệp năm 1967–1968, 'Note on the UNDP offshore fishery development project in Vietnam', Saigon, 29 Sept. 1967. Concern grew as the fleet motorised. See the calls for more vessels and expanded fisheries patrols in VNA2, Nha Ngư nghiệp, Hồ sơ số 68: Chương trình, báo cáo hoạt động năm 1974 của Nha ngư Nghiệp, 'Nha Ngư Nghiệp, Chương trình phát triển ngư nghiệp 1974'.

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consultants just months later gives some idea of the importance the new republic attached to the issue of fisheries development, as does the continuing work of fisheries officials through the following years of war and political upheaval.

American officials were similarly interested in using 'modernisation' as a weapon in the struggle against the spread of communism, defusing political unrest, and establishing control over the RVN's waters and coastlines.[25] Yet unlike in the Philippines, where its experts would play an important role in the modernisation of the fishing industry, in the RVN the United States played a supporting role: helping set up the new independent Bureau of Fisheries, paying the salaries of international consultants, facilitating cooperation with key agencies like United States Operations Mission (USOM) and Military Assistance Advisory Group (MAAG), encouraging exchange with American marine science institutions, and subsidising the purchase of the RVN's first marine engines.[26] Otherwise, American officials focused on matters more directly related to security. A 1962 Blue Book prepared by the US Military's Advanced Research Projects Agency, for example, contains an exhaustive catalogue and descriptions of the different craft used in RVN's waters.[27] It was intended to aid in the identification of enemy boats, on the one hand, and to advocate for the expansion of an irregular 'Junk Force' of small, lightly armed motorised boats under the command of the RVN Navy that would be used for coastal patrol and interdiction.[28] But after 1965 the force became a minor appendage to massive US naval operations with names like 'Game Warden' and 'Market Time'. Thus, while American officials were intensely interested in the boats that plied Vietnam's waters, they left the matter of fish to others.[29]

Those others would be Vietnamese and Japanese. In April 1955, Trần Văn Trí, the newly appointed director of the RVN Fisheries Bureau, returned from a fact-finding mission to Japan.[30] He was full of praise for the science, technology, and industrial and commercial networks he found there. His enthusiasm is all the more remarkable given that he wrote his report in French. Despite a colonial education

25 For the origins of modernisation theory, see Latham, *Modernization as ideology*. For development and global strategy, see Nick Cullather, *The hungry world: America's Cold War battle against poverty in Asia* (Cambridge, MA: Harvard University Press, 2013).

26 For US involvement in the creation of the Fisheries Bureau see VNA2, Nha Ngư nghiệp, Hồ sơ số 496: Tài liệu của Sở Ngư nghiệp Hoa Kỳ về phương pháp đánh bắt cá năm 1956. For programmes to subsidise the purchase of marine engines, see VNA2, Nha Ngư nghiệp, Hồ sơ số 505: Hồ sơ v/v điều tra nghiệp vụ quản trị thủy động cơ viện trợ trong thời gian Nha Ngư nghiệp phụ trách năm 1962–1963, 'USAID Project Title: Fisheries Development; Project No: 430-18-062'. For US involvement in the Philippines, see Butcher, *The closing of the frontier,* pp. 177–93.

27 The Advanced Research Projects Agency, R&D Field Unit South Vietnam in Conjunction with the Combat Development and Test Center of the Republic of Vietnam Armed Forces, *Junk blue book: A handbook of junks of South Vietnam* (Saigon, 1962), www.paperlessarchives.com/FreeTitles/VietnamWarJunkBluebook.pdf (accessed 29 Sept. 2018).

28 For the Junk Force, see Victor Croizat, *Vietnam river warfare 1945–1975* (London: Blandford, 1984).

29 Fisheries remained interesting at the level of the macro economy and its implications for social stability. See for example, Howard Steele, Harlan Lampe and Robert Niehaus, *Demand and supply potentials for South Vietnam's fishery industry* (Washington, DC: International Development Center, Economic Research Service, US Department of Agriculture, 1974).

30 See VNA2, Bộ Công chánh và Giao thông (1948–1966), Mục lục số 1 — Hồ sơ số 10997: Phúc trình công cán tại Nhật Bản trong tháng 4/1955 của ông Trần Văn Trí, Thanh tra ngư nghiệp tại Bộ Công chánh năm 1955.

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that seems to have left him, at least in 1955, more comfortable writing in French than in Vietnamese, Director Trí clearly saw Japan rather than France or the United States as the model that the RVN had to emulate.[31] Over the next two decades, scores of Vietnamese officials, students, technicians, and sailors would spend time in Japan and on Japanese vessels whether as part of fact-finding missions or for study, training, or internships.[32] Their affinity for Japan reflected its status as a technologically advanced nation with one of the world's most productive fishing industries. Yet it also reflected the way that Japanese and Vietnamese in many ways spoke the same language of development.

In part, this derived from the way that fisheries development in both nations took place in the context of contests for territories and resources that could determine the very fate of the nation. Yet it also flowed from the way Vietnamese and Japanese derive much of their vocabulary from common origins in an East Asian cultural world shaped by Taoist, Confucian, and Buddhist traditions. Important concepts like 'nature' (Vietnamese *thiên nhiên,* Japanese *tenzen*), 'naturally' (Vietnamese *tự nhiên,* Japanese *shizen*), or 'development' (*phát triển*, Japanese *kaihatsu*), could be mapped more or less directly from Japanese to Vietnamese and back again in ways that English or French terms could not. Terms like these contributed to a shared understanding that the natural world — and human intervention in it — reflected a larger cosmological order.[33] Director Trí and his successors may have been reading Vietnamese translations of the reports by Japanese consultants like Kaneko, but in an important sense they were all speaking the same language of development and its relationship to the environment.

Somatic industrial fisheries

It is tempting to see the object of Vietnamese and Japanese developmental imaginings as existing in a sort of pre-lapsarian state of nature before 1956. It did not. While they may have depended on wind, sun, and tides for their energy and forests and fields for their materials, nevertheless by 1960 Vietnamese fisheries had been commercialised for centuries. In 1631 the Jesuit missionary Christophoro Borri

31 Later reports by Director Trí were written in Vietnamese.

32 See for example, the two-year-long programme of visits to Japan by Vietnamese fisheries experts between 1957 and 1959. VNA2, Phủ Tổng thống Đệ nhất Cộng hòa (1954–1963), Hồ sơ số 12824: Bản ghi trình của 4 phái đoàn Ngư Nghiệp Việt Nam. See also the training of Vietnamese researchers and crew aboard the research vessels, the *Hữu Nghị* and the *Kyoshin Maru No. 52* as part of an FAO-funded, Japanese-operated marine resource research programme. VNA2, Nha Ngư nghiệp, Hồ sơ số 44: Tờ trình hoạt động năm 1970 của Nha Ngư nghiệp, 'Tờ trình niên để 1970 về hoạt động của Nha Ngư nghiệp'.

33 The term *thiên địa* (Japanese *tenchi*), which literally means 'heaven and earth', contains ideas of 'everything under heaven' or 'the entire world', along with the idea that this world reflects a logical cosmological order. The usual term for nature, *thiên nhiên* (Japanese *tenzen*), takes up the word *thiên* (the cosmological order) and combines it with *nhiên* (occurring) to capture the idea of 'that which occurs according to the cosmological order', or without human intervention. The related terms *tự nhiên* (Japanese *shizen*) and *tất nhiên* (Japanese *tōzen*) typically translated into English as 'naturally' or 'inevitably' combine the idea of *nhiên* (occurring) with *tự* (of itself) or *tất* (surely, wholly) to capture the ideas of 'spontaneously', 'occurring without effort', or 'according to the innate characteristics of the thing'. A final concept is that of 'develop' or 'development'. In Vietnamese, the term is rendered as *phát triển* (Japanese *kaihatsu*), which combines the notion of 'opening up' or 'making prosper' (*phát*) with extending or exhibiting (*triển*).

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described the fishing trade of Cochinchina as 'a pritty spectacle to behold [with] so many rankes of men, carrying fish from the sea side, even up to the mountaines'.[34] These fisheries were closely associated with salt works, on the one side, and on the other with the production of salted fish, shrimp paste, and above all that indispensable Vietnamese condiment, fish sauce. Salted and brined fish products were objects of exchange, circulating widely throughout upland and lowland regions.[35] Through taxes on fish sauce, in the eighteenth century the fishing industry had become a major contributor to central budgets.[36] On the eve of French rule, centres for commercial fishing and their associated fish-preserving industries were strung along the Vietnamese coast, with growing concentrations in places like Ba Làng and Do Xuyên in Thanh Hoá province, Mũi Né and Phan Thiết in Bình Thuận, and Dương Đông on the island of Phú Quốc. Yet while they may have been commercialised, Vietnamese fisheries were overwhelmingly inshore and nearshore, with much of the catch coming from nets and weirs set in shallow waters close to shore, and boats rarely venturing more than a few kilometres from land.[37]

The advent of French rule and the deeper integration of Vietnamese fisheries in regional trade networks brought further commercialisation. Fish products were an important export item throughout the colonial period, going to markets in Singapore, Batavia, Penang, and Hong Kong. The importance of fisheries to the economy was underlined in 1920 when the colonial administration created an Indochinese Institute of Oceanography and Fisheries.[38] The Institute's researchers catalogued Indochina's freshwater and marine resources, experimented with new techniques like trawling, and documented the existence of fertile fishing banks off the coast.[39] They even researched the production of fish sauce and attempted to develop new uses for local sea products. Nevertheless, concrete efforts to promote the use of new technologies and methods were lacking, and for the most part the Institute's directors contented themselves with annual laments at the backwardness of local marine fisheries.

The point of comparison for French officials' developmental imaginings were Chinese, and increasingly, Japanese fishing fleets. Boats operating out of Hainan

34 Christophoro Borri, *Cochin-China: Containing many admirable rarities and singularities of that country* (London: Robert Ashley, 1633), chaps. 3 and 4.

35 Nguyen Thanh Nha, *Tableau Économique du Vietnam aux XVIIe et XVIIIe siècles* (Paris: Editions Cujas, 1970), p. 84. See also Lê Quý Đôn, *Phu biên tập lục,* Lê Xuân Giáo, ed. (Saigon: Phủ Quốc vụ khanh đạc trách Văn hóa, 1972), vols. 1 and 2; Li Tana, *Nguyễn Cochinchina: Southern Vietnam in the seventeenth and eighteenth centuries* (Ithaca, NY: Cornell SEAP, 1998).

36 Lê Quý Đôn, *Phu biên tập lục*, vol. 2, pp. 61–4.

37 There were exceptions, most notably the companies of men from Quảng Ngãi who exploited the marine resources of the Paracel archipelago under the Nguyễn dynasty. Nevertheless, in the 1960s Japanese consultants observed that even offshore fishers rarely exploited grounds farther than 20 to 30 kilometres from land.

38 See also Jean Abel Gruvel, *L'Indochine: ses richesses marines et fluviales* (Paris: Société d'Editions Géographiques, Maritimes, et Coloniales, 1925). The new interest in marine resources was part of an empire-wide emphasis on economic development after the First World War. For the origins and activities of Indochina's Oceanographic Institute, see Gerard Sasges, 'Absent maps, marine science, and the reimagination of the South China Sea, 1922–1939', *Journal of Asian Studies* 75, 1 (2016): 1–24.

39 See the lovingly prepared homage to Vietnamese boatbuilding produced by the fisheries official Jean Pietri, *Voiliers d'Indochine* (Hanoi: Imprimeries et Librairies Indochinoises, 1943).

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and the ports of southern China had long exploited the marine resources of the Gulf of Tonkin and the South China Sea. Beginning in the early twentieth century, they were joined by Japanese boats.[40] These boats brought with them new techniques developed in concert with state-supported fisheries research institutions, and new technologies like refrigeration and steam-powered, then later, diesel-powered ships. The threat — economic and fiscal more than ecological — represented by the Japanese fishing fleets was the motive behind an initiative by Indochina's officials to expand the colony's maritime territorial limit from the then-customary three-nautical-mile limit to twelve in 1933.[41] And yet it was the very technologies and practices of the Japanese fleets — diesel power, refrigeration, and trawling — that French fisheries officials aspired to as they contemplated the underdeveloped state of Vietnam's fishing fleet in the 1930s. Needless to say, their dreams of fisheries development never came to pass, and in 1956 the Vietnamese fishing fleet was little different from a hundred or even two hundred years before. Fishers used long-lines, seines, weirs, and traps to catch fish for family consumption or for sale at local markets. Many fished part-time, integrating fishing with farming. Energy came from humans, wind, tides, and sun, and materials like ramie, hemp, rattan, tar, and wood came from Vietnam's fields and forests.

This doesn't mean that inshore and nearshore ecologies were not already under considerable pressure.[42] On the contrary, Kaneko's observations make it clear that Vietnamese fishers were aware that their activities were affecting marine ecologies, and had developed practices that served to mediate the relationship between humans and the ocean.[43] These ranged from the whale worship (*tục thờ cá Ông*) common along the southern and central Vietnamese coast, to the ritual opening and closing of fishing seasons in different villages. The sheer number of highly specialised fishing tools he encountered, each often targeting a handful of species in particular ecosystems, also enhanced the sustainability of local fishing banks, as did limits on their use. After a visit to the province of Phan Thiết, Kaneko wrote, 'I was very surprised to find that until now, fishermen there are still bound by ancient customs. For example, because they forbid it, I was unable to fish with *lưới chà* and *lưới mành mòi* (types of boat-held laid-out nets used in provinces further to the north), with

40 Pierre Chevey, *Rapport sur le fonctionnement de l'Institut Océanographique de l'Indochine pendant l'année 1930–1931* (Saigon: Gouvernement General de l'Indochine, 1931), p. 25. This was part of a larger movement of people and practices that saw Japanese fishers participate in the exploitation of marine resources around the Pacific and Indian Oceans. For the role of the Japanese, see Micah Muscolino, *Fishing wars and environmental change in late imperial and modern China* (Cambridge, MA: Harvard University Asia Center, 2009).

41 Pierre Chevey, *Rapport sur le fonctionnement de l'Institut Océanographique de l'Indochine pendant l'année 1933–1934* (Saigon: Gouvernement General de l'Indochine, 1934), p. 14.

42 For a classic account of ecological transformation using pre-industrial technologies see W. Jeffrey Bolster, *The mortal sea: Fishing the Atlantic in the age of sail* (Cambridge, MA: Harvard University Press, 2012).

43 For a discussion of customary resource regulation in the Malukus, see Charles Zerner, 'Through a green lens: The construction of customary environmental law and community in Indonesia's Maluku Islands', *Law & Society Review* 28, 5 (1994): 1079–122. See also Fikret Berkes' writings on the function of specific fishing gears used by subarctic native communities. Fikret Berkes, *Sacred ecology* (New York: Routledge, 2008).

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the result that I was only able to catch small amounts of fish'.[44] Whether he conceived of them in these terms or not, prohibitions like this were part of customs and practices worked out over centuries by communities of fishers in a painstaking process of experimentation in sustainable fishing.

Kaneko's peregrinations also made it clear the extent to which fishing in Vietnam was a seasonal and irregular occupation. Kaneko estimated the vagaries of winds and weather in central Vietnam would allow a sailboat to operate up to 23 days per month. Yet in practice, boats put to sea far less often. The real average, he guessed, was less than 15 days per month. Many boats only fished in season, while still others only put to sea when the catches of other boats made it clear that fishing was particularly profitable.[45] Viewed one way, these fishers were exhibiting a form of economic rationality, recognising that decreasing returns to investment made fishing year-round uneconomical. Viewed from another, strategies such as these decreased risk by allowing fisher-farmers to derive income from across a diverse range of aquatic and terrestrial sources. While we cannot know for sure how successful these practices were and how sustainable Vietnamese fisheries were before 1956, they show clearly that Vietnamese fishers knew that their activities were having an impact on the marine ecologies they exploited, and had taken steps to protect those resources and promote their more sustainable use. Yet while some might interpret such measures as a prudent form of conservation, for Kaneko, they were obstacles to be obliterated.

A way of life

The fisheries development plan that officials elaborated after 1956 was remarkably comprehensive, including the construction of new ports and markets, ice factories, refrigeration facilities, and canneries, and commercial aquaculture. But at its base, the plan depended on the increased fish landings that were assumed would result from the use of new machines — marine engines — and methods — above all trawling. The term Vietnamese officials coined as a shorthand for the larger project '*ngư cơ cụ*', combining elements from words for fisheries, motors, and tackle, respectively, shows clearly its overriding objectives.[46] In fact, the programme differed little from those advocated by French fisheries officials in the 1930s and Japanese in the 1940s. There were innovations, of course: synthetic fibres for nets, electric lights for night-time fishing, and commercial aquaculture. But whether elaborated by French, Japanese, or Vietnamese, fisheries development plans in this period depended on a high modernist faith in technology as a driver of progress, a reductionist understanding of complex marine ecologies, a vision of fishing as an industry whose goal was the ever-increasing 'production' of fish, and an assumption of the infinite productivity of the seas. Beginning in the 1950s, this vision of fisheries development would finally be realised. Vietnam's fisheries would be transformed from somatic to

44 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Rapport Technique', Sept. 1960.
45 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 12 Dec. 1963.
46 *Ngư* (a prefix denoting fish or fishing); *cơ* (from *động cơ*, or motor); *cụ* (from *công cụ* /*dụng cụ*, or rig, equipment, mechanical tool). VNA2, Nha Ngư nghiệp, Hồ sơ số 68: Chương trình, báo cáo hoạt động năm 1974 của Nha ngư Nghiệp, 'Báo Cáo Hoạt Động Niên Đề 1974.'

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paleotechnic and integrated within the global acceleration of human impact on earth systems.

Kaneko undoubtedly shared these high modernist assumptions and was committed to a kind of fisheries development that would see existing ways of life undermined, superseded, and eventually erased. At the same time, he evinced a genuine interest in the technologies, practices, and people he encountered. Unlike some of his colleagues, for example, he refused to criticise fishers for their unwillingness to participate in the cooperatives the state had designated to be the nexus of social, economic, and political change.[47] According to Kaneko, when he asked why they didn't form cooperatives to pool their resources, fishers replied 'we don't like this manner of joining together to form unions' (*không thích cái lối hùn hợp đó*).[48] According to them, cooperatives were 'useless crap' (*một cái gì vô bổ*), and 'government lackeys' (*tay sai của chính quyền*).[49] In response, Kaneko recommended adapting programmes that preserved the autonomy of fishers and took advantage of the initiative and determination evidenced by individual captains and their crews.

A project to create a comprehensive catalogue of the diverse equipment and techniques then in use by Vietnamese fishers was another testament to his interest in local technologies. For more than five years, Kaneko and his counterparts in the Fisheries Bureau visited villages up and down southern Vietnam's coasts and rivers, observing, measuring, using existing technologies and demonstrating new ones. In some reports, he would note with surprise how nets, materials, and practices in villages separated by only a few score kilometres might be completely different. In others, he would speculate that adaptations to the new nylon netting by fishermen in one region were already being taken up in another. Nor did Kaneko hesitate to admit his ignorance: his reports are punctuated with references to 'completely new' equipment or practices and of his need to undertake further studies.[50]

Rather than the radical reductionism of high modernist planning, his work, set out in his reports and summarised in a book published in 1965, instead reveals a great deal of sensitivity to the diversity of local knowledge and practices.[51] Over 17 pages, the report catalogues an array of 346 gill nets, cover nets, scoop nets, lift nets, surrounding nets, drag nets, set nets, angling gears, thrusting implements, hooking implements, wrenching implements, tearing implements, set traps, straying fish traps, enforcing fish traps, plus a further 116 'others' 'for further research'. The task of naming the profusion of tools he encountered compelled Kaneko to borrow freely from both Western and Japanese vocabularies: a *lưới đòn*, for example, becomes

47 VNA2, Phủ Tổng thống Đệ nhất Cộng hòa (1954–1963), Hồ sơ số 12823: Báo cáo hoạt động năm 1959 của chuyên viên Nhật tại Nha Ngư nghiệp, 'Buổi họp tổng kết công tác của các Chuyên viên Nhật tại Nha Ngu Nghiệp ngày 1.12.59'.

48 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 12 Dec. 1963.

49 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko – chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Rapport Technique', 18 Mar. 1964.

50 See for example, 'Đối với tôi, Lừ là một ngư cụ hoàn toàn mới lạ … thì cũng cần phải ra tại chỗ mà khảo sát', VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko – chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo kỹ thuật số 4', 25 June 1963.

51 Trần Văn Trí and Soichi Kaneko, *Hải và Lục Ngư Nghiệp tại Cộng Hoà Việt Nam* (Saigon, 1965).

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'beam trawl', while a *lưới đăng nò đáy* becomes '*otoshiami*'. For each tool, the report included information like the size of the mesh, dimensions of the net, where it was used (varying from the 'whole country' to specific villages), and the marine resource it was used to exploit. Readers of Kaneko's reports cannot help but be struck by his detailed and sympathetic description of life on the water in 1960s Vietnam. Yet as he patiently documented one way of life, he laid the groundwork for its replacement by another.

Adapting

The change did not come easily. Looking back from the vantage of 1962, Bureau of Fisheries Director Ngô Bá Thành admitted that early programmes to encourage the adoption of motors encountered resistance as fishermen were unconvinced of their benefits and deterred by their high cost. Even though US and Japanese subsidies meant the engines could be had at half their real cost, purchases were few. According to Director Thành, the combination of demonstrations by fisheries officials and the increased catches brought in by early adopters eventually resulted in increased sales. By 1962, 'the response of fishermen to the project of motorisation has become a boisterous movement (*phong trào rầm rộ*) everywhere, and the number of motors supplied under the USAID programme cannot meet demand that grows every day'.[52] Director Thành had reason to emphasise the positive. The Bureau's management of the subsidy was plagued by mismanagement and graft. At the same time, engines were sold on at a profit by their purchasers, diverted to agricultural and other uses, and often rendered unusable due to lack of maintenance or modification by untrained mechanics.[53]

If the subsidies may not have worked quite as intended, nevertheless the Bureau and its Japanese consultants played a crucial, and far more practical role in promoting motorisation. When fishers proved sceptical that their boats could withstand the stresses imposed by even small marine engines, consultants responded by converting the boats of local fisheries offices in order to demonstrate it was feasible.[54] Faced with the small boats made from woven bamboo common along the central and southern coasts, the consultants developed new propellers and chain drives.[55] As much as subsidies, experimentation, adaptation, and demonstrations like these played a significant role in making motorisation possible.

52 VNA2, Nha Ngư nghiệp, Hồ sơ số 505: Hồ sơ v/v điều tra nghiệp vụ quản trị thủy động cơ viện trợ trong thời gian Nha Ngư nghiệp phụ trách năm 1962–1963, report by Director Ngô Bá Thành, Saigon, 30 Apr. 1962.

53 See VNA2, Nha Ngư nghiệp, Hồ sơ số 505: Hồ sơ v/v điều tra nghiệp vụ quản trị thủy động cơ viện trợ trong thời gian Nha Ngư nghiệp phụ trách năm 1962–1963, 'Biên bản phiên họp ngày 5/12/62 của Uỷ Ban Trung Ương điều tra thuỷ động cơ'.

54 VNA2, Phủ Tổng thống Đệ nhất Cộng hòa (1954–1963), Hồ sơ số 12823: Báo cáo hoạt động năm 1959 của chuyên viên Nhật tại Nha Ngư nghiệp, 'Buổi họp tổng kết công tác của các Chuyên viên Nhật tại Nha Ngu Nghiệp ngày 1.12.59'.

55 VNA2, Phủ Tổng thống Đệ nhất Cộng hòa (1954–1963), Hồ sơ số 12823: Báo cáo hoạt động năm 1959 của chuyên viên Nhật tại Nha Ngư nghiệp, 'Buổi họp tổng kết công tác của các Chuyên viên Nhật tại Nha Ngu Nghiệp ngày 1.12.59'. For woven boat construction, see Ken Preston, 'The use of basketry in the hulls of Vietnamese seagoing boats: The status as of 2015 and the question of the future', *Moussons* 27 (2016): 23–58.

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Marine engines were not the only technology whose adoption was hindered by scarcity and high cost. Vietnam's first shipment of nylon nets arrived in 1959, imported with great effort and at considerable expense by the Fisheries Bureau so that Kaneko's predecessor Hamagaki could construct demonstration nets. Unfortunately, more than 10 per cent of the nets went missing. Thieves had removed sheets of nets from the packing cases and replaced them with rocks to disguise the difference in weight. The theft was accompanied by reports that unknown agents were offering to sell sheets of nylon netting to fishermen in Rạch Giá at a price of US$7,000 per sheet.[56] Hamagaki mused that 'if the police are requested to investigate this episode, I'm confident that the gang of thieves who stole the netting can be arrested with little trouble'.

Challenges like this aside, importing nylon nets was the easy part. Adapting them to local conditions was more difficult. In 1963, Kaneko's colleague Nguyễn Vĩnh Bảo reported the results of the Fisheries Bureau's first trial with a purpose-designed net.[57] After working with Kaneko and fishers to study both the capacities of the new materials and the habits of the threadfin (*cá gộc*) they hoped to catch, Bảo spent the next five months designing and creating the new nylon nets. He made numerous innovations, including halving the height of the net, doubling its length, and using plastic floats for buoyancy. Yet the experimental net was far from successful: after just one trial, it was torn in 88 different places. More troublingly, their only catch were two perch and a few trash fish. Nevertheless, Bảo was right when he pointed out that the trial was only a first step, and that the gradual accumulation of more practical experience would ultimately result in success.

The Bureau of Fisheries contributed to the accumulation of knowledge and the adaptation of new technologies. But Vietnamese fishers probably made an even greater contribution. In the same month Bảo was conducting his trials, Kaneko spent several weeks with a large cooperative of 100 boats and more than 380 fishers in Phú Vang near Huế.[58] Fishers there had already begun adopting Kuralon fibres for making nets.[59] Like Bảo, they had increased the length of nets made with the new material, but unlike the fisheries official, they increased them by only 30 percent. When fishers were unable to explain why, Kaneko speculated that the modification was based on experimentation in other regions, and that the information was circulating along the central coast.

In the end, the fisheries revolution was probably driven mainly by careful adaptation and ongoing demonstrations combined with the hard work and financial ingenuity of fishers themselves. The reports of the Japanese consultants are filled with accounts of fishers asking for nylon nets or demanding marine engines 'at

56 VNA2, Nha Ngư nghiệp, Hồ sơ số 500: Tập báo cáo của Ông SAKUMA HAMAGAKI — chuyên viên ngư cụ (lưới) của Nhật v/v khảo sát ngư cụ ngành ngư nghiệp Việt Nam từ ngày 17/9/1958 đến ngày 04/12/1959, 'Rapport Technique', 1 Apr. 1959.

57 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo Kỹ thuật', 25 June 1963.

58 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Rapport technique', June 1960.

59 An early synthetic fibre made from polyvinyl alcohol (PVA) produced by the Kuraray Company, a Japanese manufacturer of chemicals, fibres and other synthetic materials.

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any price'.[60] This was, of course, exactly what officials wanted them to say. And yet the rapid shift to trawling, the steady increase in motorised boats, and the adoption of plastic nets, lines, and floats are all testament to real demand. After an initial period that saw sail-powered boats adopting trawling techniques, in the mid-1960s sales of marine engines began to pick up so that by the end of the decade 6,000 to 7,000 motorised boats were joining the nation's fleet annually. These boats in turn brought in larger catches from more distant fishing grounds. This revolution was driven by the convergence of state-led development efforts with fishers' own commitment to modernise and thereby improve their lives and those of their families. But it was also a response to catastrophic changes in marine ecologies.

The secret but brutal cause

It may seem hard to conceive of ecological collapse as a good thing. Yet for Kaneko it was. In a report from Đà Nẵng in 1963, Kaneko described candidly how under pressure from trawling with single- and paired-sailboats, 'the population of anchovy in the bay has already dropped dramatically (anchovy is the base for making the famous Nam-O type of fish sauce), and the fishing grounds in the bay have basically been exhausted because of the use of trawling nets'. Yet the fisheries' imminent collapse in no way undermined Kaneko's faith in trawling as a technology for exploiting inshore marine resources. Instead, both the technology and the collapse of the fisheries were equally natural, as was the response: more intensive trawling of new ecologies. The collapse of the Đà Nẵng fisheries was an inevitable, even welcome, event. As Kaneko wrote, 'thus, transforming fishing in the bay into open water fishing is a goal that responds to all objectives: the happiness of fishermen, increasing production, supplying fish meat, protecting resources, and developing fisheries, etc.'.[61]

Kaneko conceived of fishing technologies in terms of a natural development from primitive to modern, unproductive to productive. From their origins in beach seines, nets had developed (*đã phát triển*) first to boat seines, then simple trawls, beam trawls, otter trawls, and finally trawling with two motorised boats.[62] Technological and environmental change were equally natural, equally interdependent. 'The development (*sự phát triển*) of trawling is of course on account of naturally occurring phenomena (*những hiện tượng phát xuất tự nhiên*)'.[63] He pointed out that in Vietnam,

60 See for example, VNA2 Phủ Tổng thống Đệ nhất Cộng hòa (1954–1963). Hồ sơ số 12823: Báo cáo hoạt động năm 1959 của chuyên viên Nhật tại Nha Ngư nghiệp, 'Rapport Technique', 16 Oct. 1958; 'Buổi họp tổng kết công tác của các Chuyên viên Nhật tại Nha Ngu Nghiệp ngày 1.12.59', See also Kaneko's special report in VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 12 Dec.1963.

61 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Dự thảo "Kê hoạch 5 năm phát triển ngư nghiệp tại Đà Nẵng"', Apr. 1963.

62 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 12 Dec. 1963.

63 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Rapport Technique', 18 Mar. 1964.

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> trawling is the fishing method developing (*đang phát triển*) most powerfully. The history of fishing in other countries demonstrates that whenever trawling becomes common then no matter what, it will lead to conflicts with other inshore fishing methods, at the same time that it drives inshore fishing grounds to collapse. As a result, beginning immediately we must prepare proactively so that we can reduce to a minimum these evident results (*hậu quả hiển nhiên*).[64]

For Kaneko, 'preparing proactively' consisted of the 'timely guidance' of the Fisheries Bureau to promote the adoption of two-boat trawling.[65] This was producing the natural collapse of inshore fisheries that would finally effect the complete conversion of the Vietnamese fleet to marine engines and the shift from inshore and nearshore fisheries to offshore. As Kaneko put it, the 'secret but brutal cause' of the conversion of the Vietnamese fishing fleet was driven by the way

> fishing grounds have already reached the point of collapse and the level of catches is in permanent decline. Mainly, this event has added an additional impulse to the shift outlined above because if fishing grounds collapse then naturally (*tự nhiên*) fishers must discover new fishing grounds offshore and inevitably (*tất nhiên*) they must adopt the method of trawling with two boats.[66]

Already by the early 1960s, the conversion of the existing fleet of sailboats to trawling placed more and more stress on local fishing grounds. In response, fishers began venturing further afield, adding further pressure to the productive fishing grounds that remained. By 1963, sailboats from Quảng Ngãi and Đà Nẵng had abandoned local grounds and were venturing as far south as Nha Trang and Phan Rí Cửa, and Kaneko speculated that sailboats up and down the coast were now operating at their maximum possible range.[67]

The adoption of marine engines only intensified this phenomenon and the inter-community conflicts that resulted. In early 1964, for example, desperate fishers in the communes of Nha Trang Đông and Vĩnh Phước in Khánh Hoà requested that provincial administrators protect their livelihoods from the threat represented by the arrival of large motorised trawlers from Phan Rí, Phan Thiết, and Vũng Tàu.[68] In two complaints to officials, villagers explained how the boats destroyed the fixed traps and lines of local fishers, raised sediment that scared fish away from the commune's traditional fishing grounds, and caught fish that rightfully belonged to the commune. Locals, with their 'primitive, traditional methods' (*những nghề thô sơ cổ truyền*), could not compete with the modern trawlers, and had been reduced to a miserable condition. They asked that officials intervene to reserve the fishing grounds for local villagers on the logic that one should make a living where one lived (*ở đâu về đó làm ăn*).

64 Ibid.
65 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 12 Dec. 1963.
66 Ibid.
67 Ibid.
68 VNA2, Nha Ngư nghiệp, Hồ sơ số 515: Tập báo cáo của Ông Soichi Kaneko — chuyên viên ngư cụ (Nhật) v/v khảo sát ngành ngư nghiệp Việt Nam năm 1960–1966, 'Báo cáo đạc biệt', 17 May 1963.

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The response of the governor of Khánh Hoà showed how technology and ecology could become bound up in issues of territory and war. Villagers' only recourse to the competition of ships from distant ports, the governor declared, was to 'organise themselves, purchase powerful engines, and go catch fish offshore in order to express the spirit of continually advancing' (*để tỏ tinh thần luôn luôn cầu tiến*). This use of the word *tiến,* which implies both an idea of progress as well as forward movement in physical space, as well as the emphatic doubling of *luôn* (always or continual) should be situated in the context of a rapidly escalating war and its very real battles to gain and control territories. In the struggle for marine resources, there would be no retreat for the RVN's fishers, only an advance ever further into new waters and deeper into new ecologies.

The spirit of continual advancing

Soichi Kaneko may have left Vietnam in 1966, but the effects of the process he and his colleagues helped set in motion continue to unfold. Today, the Vietnamese fishing fleet is overwhelmingly motorised, the boats' diesel engines contributing to the atmosphere's carbon load. With catches declining as the last of the South China Sea's fishing grounds collapse in their turn, Vietnamese venture to ever more distant fishing grounds, joining a global competition for the ocean's remaining resources. And on a beach somewhere, or perhaps in the Great Pacific Garbage Patch, the nylon nets that Hamagaki imported with such effort in 1959 slowly degrade into ever smaller particles of plastic. Thanks in part to a long-forgotten fisheries technician from Japan, a global process we now call the Great Acceleration had begun to play out in the waters of Vietnam and the lives of its coastal peoples.

This process was made possible thanks to the patient gathering of detailed information, careful adaptation of equipment, and thousands of hours of demonstrating, training, and exhorting by Japanese and Vietnamese officials. Local fishers played a crucial role, sharing knowledge, conducting their own experiments and adaptations, and ultimately adopting new fishing methods and technologies that for a time produced larger catches at lower cost. Nevertheless, the underlying driver of these processes was ecological change, as more intensive exploitation triggered the collapse of inshore and nearshore fishing grounds and drove fishers to use new technologies to exploit ever more distant and deeper ecologies.

It was also made possible by a particular conception of the relationship of humans with the marine environment. In a fundamental sense, shared vocabularies allowed Vietnamese and Japanese to conceive of new fisheries technologies and the ecological transformations they wrought as the natural and inevitable expressions of a cosmological order. In a more immediate sense, in the RVN fisheries development doctrines with their origin in Meiji Japan would be transposed from one context of state-building and war-making to another. The governor's exhortation that the impoverished fishers of Khánh Hoà 'express the spirit of continually advancing' underlines how Vietnamese officials, much like their Japanese counterparts twenty years before, saw themselves as engaged in an existential contest in which individuals, communities, and the ecologies on which they depended would all be called upon to make painful sacrifices in the name of development and the nation. But where the

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Japanese had located the origins of this existential struggle in empire and Social Darwinism, in the RVN it originated in the global struggle between Capitalism and Communism and in a Cold War turned hot. Wherever it came from, however, it promoted a vision of marine ecologies as front lines in a battle where there could be no retreat.

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