

Protecting Waters for Profit: The Development and Conservation of Baekhap Farming in South Korea, 1965–1979*

WON Chuyoung[†]

Introduction

Recent historiography on the Park Chung Hee era has begun to explore the complex interplay between development and conservation. For instance, when Korean scientists took part in national park initiatives and conservation campaigns in the 1960s and 1970s, their use of the term conservation sometimes aligned with the development agenda of the South Korean government. This indicates that conservation and development were not strictly opposed but often intertwined.¹

In line with this perspective, this paper examines hard clam (*Meretrix lusoria*; hereafter baekhap) 백합 aquaculture in South Korea from the mid-1960s to the late 1970s as a case for understanding the relationship between development and conservation.² Baekhap is native to the Korean Peninsula except for Hamgyeong-do. It thrives in water temperatures between 11°C and 28°C, with optimal growth at

Received July 22, 2025; Reviewed August 18, 2025; Accepted September 3, 2025.

DOI: <http://dx.doi.org/10.36092/KJHS.2025.47.2.265>

[†] Department of Humanities and Social Medicine, The Catholic University of Korea, chuyoungwon@gmail.com

* I would like to thank the anonymous reviewers and the editorial board of the Korean History of Science Society for their valuable comments. I am also grateful to Jaehwan Hyun for his comments and steady support throughout the writing process, and to Tomohisa Sumida for providing Japanese materials that broadened the scope of my research. Finally, I extend my thanks to the librarians at the National Institute of Fisheries Science for their assistance. This research was supported by Research Fund of Banseok Foundation.

¹ For recent historiography on the relationship between conservation and development, see Jaehwan Hyun, “Negotiating Conservation and Competition: National Parks and ‘Victory-Over-Communism’ Diplomacy in South Korea,” *The British Journal for the History of Science* 5 September 57 (2023), 239-255; Chuyoung Won, “Development for the Environment? The Inland Fish Farming Development and Nature Conservation Movement in Korea during the 1970s, 환경을 위한 개발?: 1970년대 내수면 개발과 한국자연보존협회의 자연보존 운동,” *Critical Review of History* 역사비평 145 (2023), 154-180; Chuyoung Won and Jaehwan Hyun, “The Korean Conservation Association’s *Chayŏnbojon* Magazine and the Conceptual Change of Nature Conservation in 1970s South Korea 『자연보존』을 통해 본 1970년대 자연보존 논의의 변화,” *Journal of Ecological and Environmental History* 생태환경과 역사 12 (2024), 73-115.

² This paper uses both aquaculture and farming as English translations of *Yangsik* 양식.

around 25.5°C. Juvenile baekhap typically inhabit brackish estuaries, but as they mature, they migrate toward deeper waters with higher salinity.³ The clam is a medium-sized bivalve that reaches a shell length of approximately 10 cm.⁴ The term baekhap was standardized as the Korean name in 1956 when Lee Byeongdon (李秉墩, 1928–1995), a professor and expert in artificial propagation at the National Fisheries University of Busan 부산수산대학, compiled a catalogue of Korean shellfish. The word itself originated as a regional dialect term widely used in Jeollanam-do and Gyeongsang-do.⁵

Baekhap aquaculture became an important target of national developmental projects in the mid-1960s when a sudden boom in exports to Japan coincided with changes in the expansion of farming areas. Production, which had been 1,505 metric tons (hereafter tons) in 1965, increased to 11,705 tons in 1971, with aquaculture accounting for 72.8 percent of the total. From the summer of 1973, however, mass die-offs began to occur in some farms. In 1975, large-scale mortalities across the entire west coast brought production into steep decline. Thereafter, baekhap aquaculture entered a complete collapse, and from the late 1970s discussions about large-scale coastal reclamation began to gather momentum.⁶

The rise and fall of baekhap aquaculture overlapped with the expansion of coastal industrial complexes 임해공업단지. The lawsuit between Honam Oil Refinery (HOR) 호남정유 and baekhap aquaculture fishers was the largest pollution-related case of the 1970s. For this reason, the trajectory of baekhap aquaculture can be regarded as a clear example of “destructive development 파괴적 개발”, a descriptive term used to indicate a form of development in which economic growth was accompanied by the destruction of nature and environmental degradation during the Park Chung Hee era.⁷

³ Fisheries Research & Development Agency, “Aquaculture of Baekhap 백합의 양식,” *Hyundai Haeyang* 현대해양 (November 1972), 67-70.

⁴ Yasuhisa Henmi, Satoshi Kobayashi, Junpei Yamaguchi, and, Masahiro Hashiguchi, “Recruitment and Movement of the Hard Clam *Meretrix lusoria* in a Tidal River of Northern Kyushu, Japan,” *Fisheries Science* 80:4 (2014), 705-714.

⁵ Byungdon Lee, *The Catalogue of Molluscan Shells of Korea* 한국산 패류 목록 (Busan Susan Daehak, 1956).

⁶ Tae-Ik Kim, “A Study on the Artificial Propagation of the Hard Clam *Meretrix lusoria* (Röding) 백합 *Meretrix Lusoria* (Röding)의 인공종묘 생산에 관한 연구” (Ph.D. dissertation, Pukyong National University, 2006), 1-2; Buan Branch Office of the Agriculture and Fishery Development Corporation, “Baekhap Aquaculture Export Project: A Case of Successful Investment 백합 양식 수출사업: 투자사업성공사례,” *Rural Development 농어촌개발* 4:2 (1972), 101-112.

⁷ For pollution-related cases of the 1970s, see Yoon Jo, “A Study on Pleading in Pollution Cases (Methods and Extent of Proof of Causation) 공해사건의 변론(인과관계 증명의 방법 및 정도)에 관한 고찰,” *Judicial Materials*, Vol. 2: *Pollution Issues and Trials* 재판자료 제2집: 공해문제와 재판 (Beopwon Haengjeongcheo, 1978), 99-126. For the term “destructive development,” see Sungtai Hong, “Modernization and Water in Korea: Focused on the ‘Modernization of Fatherland’

During this era, however, there were developmental projects that included elements resembling forms of nature conservation. A representative example is the inland fishery development project in the early 1970s. At that time, the South Korean government designated “protected waters 보호수면” in dams and reservoirs, prohibiting fishing after the release of freshwater species such as carp and crucian carp, with the aim of increasing fish populations.⁸ The purpose of such projects was to harness nature for economic benefit and to render these economic activities sustainable. Baekhap aquaculture was the very first development project of the Park Chung Hee era to designate protected waters as part of its strategy.

As historian Seohyun Park has shown, the Park Chung Hee government regarded the quantification and control of natural resources as crucial to the success of its developmental projects.⁹ In the case of baekhap, however, measuring natural stocks accurately proved difficult. The species’ migratory habits and irregular reproduction patterns, which could not be predicted annually, complicated this effort. Moreover, artificial propagation methods had not yet been developed either in Korea or abroad, so baekhap had to be obtained from natural stocks and transplanted into aquaculture farms. As marine pollution spread and mass die-offs devastated clam farms, however, the designation of protected waters gradually lost its importance within development projects. In this respect, I will argue that nature-conserving approaches in the Park Chung Hee era’s developmental projects were ultimately temporary and palliative.

This paper consists of four sections. It first examines how baekhap aquaculture projects unexpectedly emerged as important initiatives within South Korea’s fisheries sector in the mid-1960s, amid intensifying competition with Japan following the fisheries agreement. The paper then considers how government support and investment expanded during the boom in exports to Japan. The following section explores the process by which baekhap seeding grounds were established and designated as protected areas, in the face of persistent difficulties in securing seed stock through artificial means. The third section reviews the crises that confronted baekhap aquaculture: the expansion of coastal industrial complexes and marine pollution triggered the first wave of difficulties, and from 1975 parasitic infections, abnormal temperature rises, and other factors led to the nationwide collapse of the industry. Finally, the paper concludes by showing how the seas that once held protected areas for baekhap aquaculture lost their significance and were reimagined as sites for land reclamation.

and the Destruction of Water 한국의 근대화와 물: ‘조국 근대화’와 물의 파괴를 중심으로,” *Economy and Society* 경제와사회 62 (2004), 296-315.

⁸ Won, “Development for the Environment?” (note 7).

⁹ Seohyun Park, “Thirsting for Controllable Water: The Transformation of South Korea’s Water Development Plan from Groundwater to Surface Water, 1962-1972 통제할 수 있는 물에 대한 갈망: 지하수에서 지표수로,” *Journal of Ecological and Environmental History* 생태환경과 역사 12 (2024), 35-71.

A Sudden Boom of Baekhap Farming

Until the mid-1960s, South Korea's fisheries operated within a protection line drawn in the surrounding waters of the Korean peninsula during the postwar period, which permitted free fishing activities inside the boundary. On September 2, 1945, the General Headquarters of the Supreme Commander for the Allied Powers (GHQ-SCAP) established the MacArthur Line, a fishing restriction boundary that prevented Japanese vessels from accessing the high seas around the Korean Peninsula. The MacArthur Line was scheduled for abolition with the signing of the Treaty of San Francisco on April 28, 1952, but on January 18, 1952, the Rhee Syngman government declared a new line for the protection of fishery resources, known as the "Peace Line 평화선" or the "Rhee Syngman Line 이승만 라인". The line guaranteed Korean vessels exclusive fishing rights and prevented Japanese fishing boats from operating in the waters of the East Sea around the Korean Peninsula, using Dokdo as a reference point.¹⁰

On June 22, 1965, the diplomatic relations between South Korea and Japan were normalized through the signing of the Treaty on Basic Relations Between Japan and the Republic of Korea 한일기본조약. This event represented a new turning point for the Korean fisheries sector, as the protection line was dismantled. The Park Chung Hee administration, which had come to power through the military coup of May 1961, actively negotiated with Japan to secure financial assistance for economic growth. The Japanese government sought to ensure that Japanese vessels could operate without restriction in the high seas through the abolition of the Peace Line.¹¹

In parallel with the Treaty, the Agreement on Fisheries between Japan and the Republic of Korea 한일어업협정 reflected the mutual interests of both countries. South Korea dismantled the Peace Line in response to the Japanese government's demands. The Japanese government, at South Korea's request, then pledged \$90 million in fisheries cooperation funds to improve the industry's fishing vessels and gear. This funding was regarded as an essential measure by the South Korean government to modernize its predominantly small-scale coastal fisheries, which relied heavily on non-motorized vessels.¹² At the same time, concerns were raised that the agreement might ultimately have a negative impact on the fisheries sector.

¹⁰ Young-Ho Choi, "Japanese Fishermen Detained by Korean Government on a Charge of Violation of the 'Peace Line' '평화선' 침범 혐의로 한국에 억류된 일본인 어민," *The Korea-Japan Historical Review* 한일관계사연구 55 (2016), 349-384.

¹¹ Ibid.

¹² "The Course of the Korea-Japan Negotiations 한일회담 시종," *Donga Ilbo*, 1965. 6. 22.

First, financial concerns were raised. The fund was provided as a loan with a 5 percent annual interest rate, and the government's plan was to repay the principal and interest not in cash but through fish catch, which required an additional yield of more than \$5 million annually. A report submitted for presidential approval at the time noted that achieving such an increase in catch would be a difficult goal, and even if it were achieved, the import restrictions on marine products imposed by the Japanese government would still present a serious obstacle.¹³

Second, the dismantling of the Peace Line under the agreement introduced a new set of competitive pressures. Critics predicted it would be difficult to increase yields from coastal and offshore fisheries, as Korean fishers would be forced to compete directly with Japanese vessels equipped with far more advanced ships and gear. In the mid-1960s, South Korea's fishing vessels and equipment were significantly underdeveloped, and most fishers relied on wooden boats.¹⁴ This situation was further exacerbated by delays in the disbursement of Japanese fisheries cooperation funds. Some newspaper critics interpreted these delays as a deliberate attempt by Japan to obstruct the modernization of the Korean fleet, fueling accusations that the agreement had deprived South Korea of its 'golden fishing grounds' and left the country misled.¹⁵

Third, as a result of the first and second, the depletion of marine resources around the Korean Peninsula was expected to accelerate. For example, Choi Sang (崔想, 1927–1973), a fisheries scientist and head of the Marine Resources Lab at the Korean Institute of Science and Technology (KIST), pointed out that high-value fish stocks like sea bream 도미 were already sharply decreasing in South Korea's coastal waters, while other fish populations were also declining in number and shrinking in size. He warned that the limitless expansion of fishing practices would lead to the depletion of biological resources in both coastal and deep-sea waters and proposed expanding aquaculture through scientific methods rather than merely increasing sea catches, promoting slogans like “Let's cultivate the sea 바다를 경작하자” and advocating a transition “from a catching fishery to a raising fishery 잡는 어업에서 기르는 어업으로”.¹⁶

¹³ “Report on Fishery Cooperation Fund Management Plan and Issues 어업협력자금 운영 계획 및 문제점 보고,” *Report for Presidential Approval* 대통령결재문서, 1966. 4. 4.

¹⁴ Fisheries Research & Development Agency, *60-Year History of the Fisheries Research & Development Agency* 국립수산진흥원 60년사 (Fisheries Research & Development Agency, 1981), 390-391.

¹⁵ “Review of Fishery Cooperation on the 2nd Anniversary of Normalized Korea-Japan Relations 한일 가교 2주년의 결산 어업협력,” *Maeil Business*, 1967. 12. 18.

¹⁶ Sang Choi, “Current Status and Issues of Fisheries and Aquaculture: Has the Prelude to Fisheries Modernization Begun? 수산양식업의 현황과 그 문제점: 수산업 근대화의 전초전은 시작되었는가?,” *Business 비지네스* 6:7 (1966), 30-35.

On March 3, 1966, the Office of Fisheries (OOF) 수산청 was established, which was in part a response to the negative predictions facing the industry.¹⁷ At a press conference marking the launch of the Office, Oh Jeongkeun (吳定根, 1929–1982), the first Administrator, declared that “the agency’s goal was to build a system capable of competing with Japan through a transition from a catching fishery to a raising fishery.” Within this framework, the OOF supported researchers at private fish hatcheries, the National Fisheries Research and Development Agency (NFRDA) 국립수산진흥원, and the National Fisheries University of Busan to carry out research on the artificial propagation of newly introduced species.¹⁸

Alongside the introduction of new species, the government had also been expanding aquaculture for species that had long been prioritized. Traditionally, laver 해태, a seaweed dried to produce *gim* 김, and oyster 굴, were regarded as the most suitable for export, so from the mid-1950s the South Korean government steadily expanded their cultivation as a central priority of its fisheries development plans. Baekhap was also considered for aquaculture, alongside oyster cultivation beginning in 1956, but the scale remained small. In effect, until the mid-1960s, baekhap lay outside the scope of the government’s developmental plans for fisheries.¹⁹

Immediately after the normalization of diplomatic relations between South Korea and Japan, however, exports of baekhap to Japan increased rapidly. As demand from Japan grew, South Korea’s baekhap production climbed to 4,671 metric tons in 1966, a sharp increase from 2,812 tons in the previous year. The majority of this output came from wild harvesting (3,332 tons), with only 1,339 tons from aquaculture, showing that initial exports relied heavily on wild-caught baekhap.²⁰ The baekhap export boom was directly linked to the sharp decline in Japan’s baekhap production, known in Japanese as *hamaguri*ハマグリ, during the 1960s. Japan’s annual production, which had exceeded 10,000 tons until 1966, plummeted in the 1970s as habitats were destroyed.²¹ The main causes were marine pollution and large-scale land reclamation for coastal industrial complexes.²²

¹⁷ Gyunhyeon Kim, “The Progress and Problems of Fisheries Propagation 수산증식의 발전상과 문제점,” *Eomin* 어민 21 (1967) 7-9.

¹⁸ Chuyoung Won, “Development for the Environment?” (note. 1)

¹⁹ Fisheries Research & Development Agency, *Baekhap Aquaculture* 백합양식 (Fisheries Research & Development Agency, 1973).

²⁰ Susan-eop Hyeopdong Johap Junganghoe, “Current Status and Problems of Baekhap Aquaculture 백합양식의 현황과 문제점,” *Suhyup Chosa* 수협조사 1:1 (1969), 28-32.

²¹ Junya Higano, “Influence of Environmental Changes in the Tidal Flats on the Filtration and Respiration of Bival Mollusks,” *Bulletin Fisheries Research Agency* 1 (2004), 33-40.

²² Buan Branch Office of the Agriculture and Fishery Development Corporation, “Baekhap Aquaculture Export Project” (note. 7); Ryu Okamoto, “The Present Conditions of Shellfish fishery in Tokyo Bay,” *Fishery and Oceanography in Tokyo Bay* 10 (2019), 35-38. For studies on the history of environmental pollution in Japan, see Timothy S. George, *Minamata: Pollution and the Struggle for Democracy in Postwar Japan* (Cambridge, MA: Harvard University Asia

The export of baekhap reshaped perceptions of the seas surrounding the Korean Peninsula. Until the mid-1960s, the most valuable waters in South Korea was considered to be the East Sea 동해. Oceanographers around the world measured the primary production of phytoplankton in the early 1950s, which provides the nutritional foundation for the entire marine ecosystem and thus serves as an indicator of the abundance of fishery resources. In Korea, these surveys began in 1963 under the direction of Choi Sang, who found that phytoplankton productivity was highest along the East Sea and lowest along the West Sea 서해.²³ With its relatively low levels of phytoplankton, the West Sea was therefore regarded as the sea with the poorest fishery resources. Moreover, its vast tidal flats were considered unsuitable for beaches or for tourism development, and the region was often dismissed as having little economic value. Reflecting this view, the tidal flats of the West Sea were often described as “dirty tidal flats like a city sewer 도시의 하수구처럼 지저분한 갯벌”. As exports of baekhap to Japan surged, however, companies and fishing village cooperatives soon began competing to invest in aquaculture, and the West Sea came to be redefined as a new ‘golden fishing ground.’²⁴ According to one fisherman at the time, baekhap aquaculture became so profitable that it could generate nine times the income of rice farming.²⁵

Establishing “Protected Waters” to Secure Seed Clams

The South Korean government began promoting the expansion of baekhap aquaculture with active financial support after baekhap production became linked to exports to Japan. Baekhap was regarded as particularly well suited to the government’s policy of fostering a “raising fishery,” which was seen as a sustainable method to produce seafood, unlike indiscriminate fishing that depleted marine resources. However, in the absence of artificial propagation techniques, the expansion of baekhap aquaculture required solving the problem of securing a stable supply of seed baekhap 백합 종묘. To address this challenge, the government designated natural seed grounds as protected waters, ensuring a reliable source of seed clams for transplantation into farms.

Center, 2001); Bratt Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (Seattle: University of Washington Press, 2011).

²³ Sang Choi, *The Wonders of the Ocean* 바다의 신비 (Gyemongsa, 1967), 268-271.

²⁴ Hanguk Jeonggyeong Yeonguso, “The Sea’s Bonanza: Baekhap Aquaculture Farms 바다의 노다지 대합양식장,” *Urideul* 우리들 24 (1967), 34-37.

²⁵ Suheung Yang, “Baekhap Aquaculture Yields Nine Times the Income of Rice Farming 백합양식은 벼농사의 9배,” *Eomin* 어민 71 (1974), 80-87.

In 1967, OOF introduced the Comprehensive Five-Year Plan for Fisheries Propagation and Development 수산증식 5개년 계획. The plan aimed to invest 675 million won to create 3,377 hectares (hereafter ha) of aquaculture farms, with the goal of raising annual production to 30,400 tons by 1974.²⁶ The government also supported baekhap aquaculture through the Special Project for the Improvement of Farmers' and Fishermen's Income 농어민 소득증대 특별사업, implemented between 1968 and 1971. The total investment in the fisheries sector under this project amounted to 3.015 billion won, and 949 million won, or 31.5 percent, was allocated to the development of 3,644 ha of baekhap fishing grounds.²⁷

The government's investment for expanding baekhap aquaculture was further consolidated with the establishment of the Agriculture and Fishery Development Corporation 농어촌개발공사 in December 1967. One of the corporation's core projects was the establishment of major production sites 주산단지 for baekhap.²⁸ As shown in Figure 1 below, under the financial support of the South Korean government, the West Sea region was planned to be developed into major production sites for baekhap by the mid-1970s.²⁹

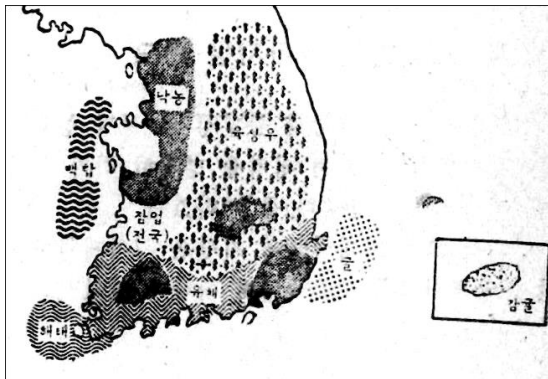


Figure 1. The West Sea was to be used as a space for baekhap production. Jo Ilho, "The Second Special Project for the Improvement of Farmers' and Fishermen's Income 제 2 차 농어민소득증대 특별사업계획," *Nongjeop Gyeongje 농업경제* 30 (1972), 82-96.

²⁶ Buan Branch Office of the Agriculture and Fishery Development Corporation, op. cit. (note. 7).

²⁷ Office of Fisheries, *30-Year History of the Office of Fisheries 수산청 30년사* (Office of Fisheries, 1996), 333.

²⁸ "40 Special Major Production Sites to Be Established 40개 특별주산지 조성," *Maeil Business*, 1968.8.1.

²⁹ Agriculture and Fishery Development Corporation, *Uninterrupted Progress, the Torch of Balanced Advancement in Agriculture and Industry 중단없는 전진, 농공병진의 횃불* (Agriculture and Fishery Development Corporation, 1971).

When the South Korean government promoted baekhap farming, it appeared to be an easy and highly promising business. This perception was based on two main considerations. First, the farming method was simple. Enclosing facilities 조위시설, made of iron bars and nets, could easily prevent baekhap from moving through the substrate, which meant that even those without specialized knowledge could engage in baekhap aquaculture with relative ease. Second, there was ample land available for development. The tidal flats of the West Sea, referred to at the time as “idle tidal flats 유헤간석지”, were regarded as optimal sites for baekhap aquaculture. As of late 1967, only 252 ha out of 5,568 ha that were considered suitable for baekhap farming were actually in use. The development rate was just 4.3 percent, and this indicated considerable potential for future growth.³⁰

Baekhap aquaculture had considerable potential, but securing a stable supply of seed baekhap remained a persistent challenge. Large farms required the continuous transplanting of juveniles, yet the supply from the wild was never sufficient. Choi Ki-chul (崔基哲, 1910–2002), a professor at Seoul National University, was deeply interested in fishery resources, and also pointed out this problem. He said that aquaculture could yield more than ten times the harvest of wild collection, but only if a steady supply of seed baekhap was secured. In the tidal flats he surveyed, adult baekhap were found, but juvenile baekhap were rarely present. Baekhap on tidal flats did not guarantee the availability of seed stock, nor did securing seeding grounds ensure predictable yields. He pointed out that securing a stable seed supply and protecting the resource from overharvesting were essential to increasing production.³¹ Choi later reinforced this point in a 1971 paper, where he reported producing a small number of seed baekhap in a laboratory using chemical injections on parent clams. Despite these experimental achievements, by this time, there was still no reliable method for the large-scale artificial propagation of seed baekhap.³²

The baekhap aquaculture industry had to rely on the collection of wild seed baekhap, since artificial propagation was not yet possible. For this reason, identifying suitable sites for securing seed baekhap became crucial, and this work was also undertaken under the Agreement on Fisheries between Japan and the Republic of Korea.³³ The two countries launched joint resource surveys and began

³⁰ Jong-rye Lee, *Strategies and Challenges for Expanding the Export of Korean Fishery Products* 우리나라 수산물의 수출확대방안과 문제점 (Korean Committee of the Food and Agriculture Organization of the United Nations, 1968), 6-14.

³¹ Ki-chul Choi, “Studies on the Structure of Tidal Flat Ecosystem for Increasing Commercial Clam Yield 유헤패류증산을 위한 간석지생태계의 구조에 관한 연구,” *The Korean Journal of Limnology* 한국육수학회지 2:3-4 (1969), 1-22.

³² Ki-Chul Choi, “Ecological Studies of the Clams, *Meretrix lusoria* and *Cyclina sinensis* for Increasing Seed Clam Yield, 대합과 가무락의 종묘 생산을 위한 생태적 연구,” *The Korean Journal of Limnology* 한국육수학회지 4:1-2 (1971), 9-19.

³³ Fisheries Research & Development Agency, *Annual Report of Fisheries Research & Development Agency, 1968-70* 국립수산진흥원연보, 1968-70 (1971), 37.

the so-called ‘Korea–Japan Aquaculture Survey’ in October 1967 with the goal of increasing baekhap production.³⁴ In this process, a site in the coastal waters near Okbong-ri, Mi-myeon, Okgu-gun (present-day Gunsan-si) was identified in April 1968 as the first location suitable for collecting seed baekhap, during an investigation by a joint survey team that included two Japanese technicians.³⁵ Following these surveys, the OOF began designating wild seed baekhap grounds as protected waters in order to secure a stable seed supply. In fact, the legal basis for such designations had already been established in the 1963 revision of the Fisheries Act 수산업법. The law authorized local administrators to designate coastal areas as protected waters for the conservation of fishery resources, but no site had actually been designated since the revision.³⁶

On May 23, 1968, the OOF issued Notification No. 13 수산청 고시, through which it officially began designating protected waters. That year, a total of four sites were designated to secure seed baekhap. By 1969, the OOF was considering designating 15 sites across Gyeonggi-do, Jeollabuk-do, Jeollanam-do, and Chungcheongnam-do.³⁷ The policy, however, drew criticism from the press, which argued that the designations were focused solely on baekhap production sites and that the government provided no additional support beyond the designations themselves.³⁸

On July 10, 1970, the government announced the Management Regulations for Baekhap Seeding Grounds 백합종패장 관리규정 through OOF Directive No. 120 수산청 훈령. The purpose of this regulation was to strengthen state control over the protected waters. The stated goal was to increase the productivity of seed baekhap and stabilize their supply to support the aquaculture industry. The regulations introduced a top-down management system. Local administrators were tasked with on-site management and annual resource surveys, while the central OOF used these reports to set national supply plans, regulate production, and provide subsidies. The rules also standardized the size of harvestable seed baekhap and required official approval for the collection of any that fell outside this specification. Considering that in the early 1970s the government also cracked down on illegal fishing during the summer in rivers and reservoirs, such as mass captures using poisons or nets, in order to protect freshwater stocks, it is likely that this centralized regulatory system was likewise aimed at preventing the overharvesting of seed baekhap. In practice, the designation of protected waters effectively turned them into state-managed baekhap

³⁴ “Joint Survey on Baekhap Aquaculture by South Korea and Japan to Start on the 21st 한일 백합 양식위해 21일부터 공동조사,” *Maeil Business*, 1967. 10. 18.

³⁵ Buan Branch Office of the Agriculture and Fishery Development Corporation, op. cit. (note 7); Hanguk Jeonggyeong Yeonguso, op. cit. (note 25).

³⁶ “Degrading Coastal Fishing Grounds 황폐돼가는 연안어장,” *Maeil Business*, 1968. 2. 12.

³⁷ Susan-eop Hyeopdong Johap Junganghoe, “Current Status and Problems of Baekhap Aquaculture” (note 21).

³⁸ “Dormant Protected Waters 낮잠자는 보호수면,” *Maeil Business*, 1968. 12. 10.

seeding grounds, from which seed could not be removed without official authorization.³⁹

The main purpose of the Management Regulations for Baekhap Seeding Grounds was to control the catch of seed baekhap. Because aquaculture depended on naturally reproduced seed baekhap, conserving seed stocks was regarded as essential for sustaining production. This approach, however, revealed inherent limitations when baekhap aquaculture was expanded on a larger scale for export, since greater amounts of seed baekhap were required. A report at the time estimated that three tons of seed were needed per ha. In 1969, the planned area for baekhap aquaculture reached about 2,590 ha, which meant a requirement of 7,700 tons of seed baekhap. Yet even when the projected yields from all 15 designated and planned protected waters were combined, the expected catch was only 6,155 tons, leaving a shortfall of about 1,600 tons. An even more serious problem was that actual yields could not be known before harvesting. The report noted that because shellfish reproduction varied greatly from year to year, the shortfall could have been even larger.⁴⁰

The shortage of seed baekhap, already a chronic problem, was further intensified in the early 1970s by changes in the Japanese import market for baekhap. First, the expansion of exports to include seed baekhap aggravated the shortage. In May 1972, South Korea began exporting not only adult clams but also seed baekhap. One case was Hakui in Ishikawa Prefecture, Japan, which imported eight tons of Korean seed baekhap. The local fisheries cooperative in Hakui dispersed the Korean seed baekhap over a 70,000-square-meter area and imposed a two-year fishing ban in an effort to restore the local baekhap population from the imports.⁴¹ Second, competition in the Japanese market began to intensify. By the early 1970s, both North Korea and the People's Republic of China began exporting baekhap to Japan. This competition not only threatened South Korea's position in the export market but also placed additional strain on its ability to secure seed baekhap, as strengthening price competitiveness required producing even greater quantities of baekhap.⁴²

In May 1973, the NFRDA initiated a large-scale survey to develop baekhap seeding grounds. A 40-member team spent two months investigating the west and south coasts to find additional seeding areas. The survey report found that a

³⁹ Hyunsoo Lee, "Protection of Fishers and Marine Resources 어민과 수산자원 보호," *Susan Gisul Hunryeon* 3 (1971) 66-74; "Twelve Sites Including Ganghwa Designated as Baekhap Seed Clam Farms 강화 등 12곳 지정 백합양식종묘장," *Maeil Business*, 1972. 8. 30; "Regulations on the Management of Baekhap Seed Clam Reserves (Protected Waters) (Office of Fisheries Directive No. 120) 백합종패장(보호수면)관리규정(수산청훈령제120호)," *Official Gazette of the Republic of Korea* 관보 No. 5596 (1970. 7. 10), BA0191594, National Archives of Korea.

⁴⁰ Susan-eop Hyeopdong Johap Junganghoe, op. cit. (note, 21).

⁴¹ "Japan Attempts to Cultivate Baekhap Using Korean Seed Clams 한국산 백합 양식," *Maeil Business*, 1972. 5. 23.

⁴² Buan Branch Office of the Agriculture and Fishery Development Corporation, op. cit. (note 7).

significant portion of these grounds remained undeveloped, and that their full use could potentially triple the 1972 seed baekhap output. This projection, however, did not present a promising outlook. Even with a threefold increase in supply, the total output would still only meet 48% of the seed required for the 5,400 hectares of baekhap farms already in operation nationwide. This made it clear that there was no solution in sight for the ongoing shortage of seed baekhap.⁴³

The survey results indicated that no solution was in sight to the chronic shortage of seed baekhap. Therefore, a plan to import seed baekhap from Japan was considered an alternative.⁴⁴ Yet, the difficulties facing baekhap aquaculture at the time were not confined to seed shortages. Increasing damage to farms caused by marine pollution was also emerging as a serious problem

Baekhap Farming in Troubled Waters

Baekhap aquaculture was highly profitable, but it was not the only development project pursued in the coastal areas during the Park Chung Hee administration. Government-led projects sometimes overlapped or conflicted, often producing contradictory outcomes. Baekhap aquaculture, for instance, directly collided with the expansion of coastal industrial sites which became a representative case of such conflict.⁴⁵ Park Byeong-Joo (朴炳柱, 1925–2015), an urban planner who was involved in Seoul's urban planning, pointed out in the early 1980s that regions rich in marine resources with well-developed fishing ports frequently also served as optimal industrial locations. Coastal industrial complexes typically required proximity to estuaries for convenient access to industrial water, and concerns about air pollution affecting nearby communities pushed their boundaries progressively seaward. This inevitable overlap with prime aquaculture sites created significant tension.⁴⁶

⁴³ Fisheries Research & Development Agency, *Development Survey for Hard Clam* 백합종패 개발조사 (Office of Fisheries, 1973).

⁴⁴ “Guidelines Issued to Member Firms for Import Recommendation of Baekhap Seed Clams 백합종패 수입추천 회원사에 요령 시달,” *Maeil Business*, 1973. 11. 16.

⁴⁵ Beginning with a water pollution survey of Ulsan Bay in 1967, the NFRDA went on to investigate potential damage to fishing grounds in major coastal industrial complexes across the country, including Jinhae Bay and Gwangyang Bay. This illustrates that the expansion of coastal industrial complexes was already being recognized as a problem by government agencies responsible for fisheries. See, Fisheries Research & Development Agency, *Report of Water Pollution Surveys in Korea (1967-1971)* 수질오탁조사 사업보고(1967-1971) (Fisheries Research & Development Agency, 1972).

⁴⁶ Ministry of Construction, *Site Planning Survey for the Formation of Coastal Industrial Belts on the East and West Coasts* 동서해안임해공업Belt형성을 위한 입지계획조사 (Ministry of Construction, 1969), 17.

Although fisheries were often regarded as fundamentally at odds with industrial complexes, in practice they required close links with industrial facilities. Because seafood was far more perishable than agricultural products, processing sectors such as canning and freezing developed early to ensure efficient distribution. Thus, even in the early 1960s, when fisheries were still widely seen as underdeveloped, facilities like fish oil plants and net-making factories were clustered around fishing ports, which served as hubs of fishing activity.⁴⁷ The rapid expansion of coastal industrial complexes in the late 1960s, however, brought unforeseen environmental and economic consequences. As these complexes grew, cases of serious damage to both baekhap stocks and local fishing communities increased, and conflicts between aquaculture and heavy industry intensified.

A salient example was the conflict between the HOR in Yecheon-gun (present-day Yeosu-si) and the fishers who managed nearby baekhap farms. The refinery inflicted direct and serious damage on local shellfish populations and the fishing economy, as oil discharged during the plant's construction caused extensive mortality of the stock. Yet, this was not simply a case in which a refinery imposed losses on small-scale local fishers in the name of national development. The tidal flats in front of the refinery had been designated in 1967 as a major baekhap production site, financed through government loans to promote exports to Japan. After the pollution damage, the fishers managing this baekhap farm demanded 172 million won in compensation from HOR. In addition, authorities in Jeollanam-do and the OOF ordered the company to compensate local fishers with 150 million won. By March 1969, however, the refinery had paid only about 7.5 million won.⁴⁸

As the case of HOR illustrates, many factories that discharged pollutants either offered minimal compensation or resisted providing adequate payments, causing pollution damages to escalate into protracted legal battles. A representative example was the lawsuit between HOR and the baekhap fishers, which was known as the largest pollution-related lawsuit of the 1970s in terms of both the amount claimed and the damages awarded. After the refinery began operations in 1969, pollutants such as wastewater and waste oil severely curtailed baekhap yields, and the remaining clams were contaminated with an oil odor that made them unsuitable for consumption. The fishers filed a civil lawsuit against the company, seeking 510

⁴⁷ Jungang Susan Geomsaso, *The Current Status and Prospects of Export Fishery Products 수출수산물의 현황과 전망* (Jungang Susan Geomsaso, 1963), 188-202.

⁴⁸ Susan-eop Hyeopdong Johap Junganghoe, "Impact of Coastal Industrial Development on Coastal Fisheries and Countermeasures: Focusing on the Issue of Water Pollution 임해 공업의 발달이 연안 어업에 미치는 영향과 그 대책: 수질오탁 문제를 중심으로," *Suhyeop Chosa* 수협조사 1:1 (1969), 10-18.

million won in damages, a sum that made it the largest pollution-related case of the decade.⁴⁹

Pollution-induced damages to aquaculture farms attracted considerable public concern at the time, prompting numerous expert discussions on how to effectively address the issue. For instance, the fisheries magazine *Hyeondae Haeyang* 현대 해양 organized several expert panels on the environmental impacts of coastal industrial complexes on fisheries, with some of these discussions broadcast by media outlets such as Munhwa Broadcasting Corporation (MBC). A particularly significant panel titled “Marine Pollution: Assessing the Severity 해수공해: 얼마나 오염되었나”, held on June 22, 1973, featured prominent participants, including experts from KIST, the OOF, and the Korea Export Corporation. Panelists critically discussed the growing number of compensation claims filed by fishers affected by pollution. While acknowledging that the ideal solution would be to avoid building coastal industrial facilities altogether, they recognized this as an unrealistic approach given the circumstances. Consequently, a consensus emerged among them on the necessity of a comprehensive, science-based strategy that would prioritize precise pollution monitoring and the establishment of clear water-quality guidelines.⁵⁰

In line with this recognition, the South Korean government also began to take marine pollution and its harmful effects on fisheries as major concerns, organizing research teams and establishing dedicated institutes to implement such an approach. In 1973, with support from the Ministry of Science and Technology, researchers from several universities joined the Korea Atomic Energy Research Institute (KAERI) 한국원자력연구소 to form a research team that conducted a survey in Gwangyang Bay. The survey examined water quality and coastal conditions near industrial complexes and major port cities, with particular attention to the effects of industrial effluents and oil discharges on the marine environment. The research team reported that although pollutant levels near the HOR did not exceed the legal thresholds set by the Prevention of Pollution Act 공해방지법, national-level environmental monitoring was needed to prevent and mitigate environmental degradation.⁵¹

On March 24, 1970, against the backdrop of rapid coastal industrial expansion, the government announced a comprehensive national plan for ocean investigation and the systematic development of marine resources. As part of this initiative, a

⁴⁹ “‘Baekhap Farm Ruined by Waste Oil’ – 500 Million Won Compensation Lawsuit ‘폐유에 백합양식장 망쳐’ – 5억원 배상소송,” *Chosun Ilbo*, 1973.5.16 ; Yoon Jo, “A Study on Pleading in Pollution Cases” (note 8).

⁵⁰ “How Polluted Is Haesoo Gonghae 해수공해 얼마나 오염되었나,” *Hyeondae Haeyang* 현대해양 (July 1973), 18-23.

⁵¹ Korea Atomic Energy Research Institute, *Environmental Baseline Survey of the Kwang Yang Bay, Korea: Water Quality Analysis and Oceanographic-Ecological Survey* 호남정유 공장을 중심으로 한 광양만 일대의 수질, 해상 및 생태학적 조사 (Ministry of Science and Technology, 1973).

research team led by Choi Sang was organized to prepare a planning report on the establishment and operation of the Ocean Development Research Institute (ODRI) 해양개발연구소. The institute also aimed to integrate marine research that had previously been carried out separately across different government ministries into a unified framework for the scientific management of the seas, while preventing degradation of the marine environment caused by industrial wastewater and other pollutants.⁵²

At the time when government discussions on marine pollution were just beginning, the damage suffered by marine species such as baekhap still had to be redressed through judicial rather than scientific means. In February 1975, amid growing discussions over pollution from coastal industrial complexes and their impact on baekhap farming, along with the initiation of scientific surveys into fisheries damage, a court ruled that HOR should compensate local aquaculture farmers with 380 million won.⁵³ A few years later, in 1978, the Seoul High Court issued a final verdict ordering the HOR to pay 266.83 million won.⁵⁴ By the mid-1970s, environmental damage to baekhap farms appeared to be finally addressed through scientific and legal channels. A different kind of crisis, however, was already unfolding in the field. Beginning in July 1973, unexplained mortality events started to appear in the primary baekhap-producing area around Buan Bay in Jeollabuk-do. These incidents intensified throughout 1974 and 1975, ultimately resulting in mass mortality in farmed baekhap stocks and effectively bringing aquaculture operations in the region to a halt.⁵⁵

⁵² For the Ocean Development Research Institute, a comprehensive marine research institute (later renamed the Korea Ocean Research and Development Institute, KORDI), see Korea Ocean Development Research Institute, *Thirty Years of the Korea Ocean Research and Development Institute* 한국해양연구원30년사 (Korea Ocean Development Research Institute, 2003), 92; Jonghwa Lee and Byungkwon Park, *A Study on the Loan Application by the Korea Ocean Research and Development Institute* 한국해양개발연구소 차관 신청에 관한 연구 (Korea Institute of Science and Technology, 1973), 31; Ocean Development Research Institute, *A Study on the Promotion of the Korean Marine Industry* 한국해양산업 육성을 위한 조사 연구 (Korea Ocean Development Research Institute, 1979);

⁵³ “Seoul District Court Orders 380 Million Won Compensation for Waste Oil Contamination of Oyster Farm 굴 양식장 폐유 오염에 3억 8천만원 서울지법 판결,” *Kyunghyang Shinmun*, 1975.2.7.

⁵⁴ “Seoul High Court Rules Against Honam Oil Refinery, Orders 200 Million Won in Compensation 서울고법, 호남정유 패소 2억 지급판결,” *Kyunghyang Shinmun*, 1978.9.9.

⁵⁵ Jongcheol Kim et al., “Environmental Factor Survey of Baekhap Aquaculture Farms on the West Coast 서해안 백합 양식장의 환경요인조사,” *Technical Report of Fisheries Research & Development Agency* 국립수산물진흥원사업보고 49 (1980), 3-42.

The Fall of Baekhap Farming and the Shifting “Protected Waters”

In the summer of 1975, mass mortality in baekhap aquaculture spread across the entire western and southern coasts of Korea, causing far greater damage to production than marine pollution. In Buan-gun and Gochang-gun of Jeollabuk-do, approximately 1,200 ha of baekhap farms were affected by disease and pest outbreaks. This accounted for 50 percent of Jeollabuk-do's total aquaculture area and resulted in the death of an estimated 600 tons of baekhap. Various explanations were proposed, including abnormal weather patterns that led to rising water temperatures, parasitic infections, and poor farm management. However, no definitive cause was identified. The OOF responded by designating the affected zones, prohibiting the release of new seed clams in those areas, and granting loan repayment deferrals to farmers who had established their farms with government financing.⁵⁶

The NFRDA conducted an investigation in 1975 into the causes of mass mortality in baekhap stocks. It identified three primary contributing factors. First, unlike oysters that grew suspended from ropes, baekhap were sedentary shellfish that burrowed into the mud of tidal flats. This substrate often contained a high load of suspended matter and sedimentation, which promoted the generation of harmful gases and the rapid depletion of dissolved oxygen through the oxidation and decomposition of organic material, leading to suffocation and physiological stress of baekhap. Second, most baekhap farms were located in intertidal zones that were exposed for over four hours during low tide. During hot summer months, water temperatures in these exposed areas often rose sharply, increasing the risk of temperature-induced mortality. Third, overstocking was also critical. While the recommended seeding density was one ton per ha, many farms introduced five to six tons, and some even up to seven or eight tons, resulting in excessive crowding. In addition, enclosing structures of baekhap farms intended to prevent baekhap movement were often built too high, obstructing tidal flow and preventing the natural flushing and purification of the farming environment. The report also raised concerns about parasitic infections such as distoma, warning that transplanting infected baekhap to other regions could spread the disease and should therefore have been strictly prohibited. The agency concluded that, to mitigate these complicated issues, farming conditions had to be improved through measures such as lowering

⁵⁶ “Mass Die-Off of Over 600 Tons of Baekhap Reported 백합 6백여t 폐사,” *Chosun Ilbo*, 1975. 8. 23; “Mass Baekhap Die-Off Hits Over 50% of Farms Along Korea's Southern West Coast 서해안 남부일대 양식장 백합 50% 이상 폐사,” *Kyunghyang Shinmun*, 1975. 8. 22.

the height of enclosing structures, reducing stocking densities, and conducting long-term studies on parasitic infections in collaboration with national fisheries universities and KIST experts.⁵⁷

In April 1976, even as the baekhap harvest season approached, the exact cause of the mass mortality remained unidentified. While parasitic infection was frequently cited as a likely culprit, no definitive cause had been confirmed. A fisheries propagation officer at the OOF noted that baekhap aquaculture had suffered severe damage due to disease for three consecutive years since 1973. This led to significant deterioration in farming conditions and made recovery in the coming years unlikely. He emphasized the need for fishers to turn over the tidal flat mud and rehabilitate their farms in a comprehensive way. At the same time, he added that the OOF should designate baekhap seeding grounds as protected waters and manage them more rigorously to ensure a stable supply of juvenile baekhap. In the absence of a clear explanation for the mass mortality, the protection of baekhap seeding grounds remained an essential and urgent measure.⁵⁸

When the South Korean government first turned its attention to developing baekhap as an export commodity, aquaculture required little specialized knowledge or technology. Anyone could participate as long as they installed simple tidal enclosures. However, as mortality rates increased, the activity evolved into a form of aquaculture that demanded scientific expertise and careful environmental management. Baekhap, once seen as a low-maintenance species, came to be recognized as requiring sophisticated cultivation techniques and close monitoring. In this context, a shellfish specialist at the NFRDA issued a set of technical guidelines. The specialist advised that after harvesting baekhap, tidal flats should undergo a form of mud tilling 경운 and then be left to rest for one to two years to prevent die-offs caused by seabed aging. The staff pointed out the importance of managing stocking density. Baekhap that had clustered densely around tidal enclosures were to be regularly redistributed across the farming area to ensure even spacing. The agency also emphasized that all technical issues in aquaculture operations had to be assessed by qualified experts. It called for routine monitoring of key indicators such as growth rates, survival rates, and population density, and recommended that the results be used to guide systematic and adaptive farm management planning.⁵⁹

⁵⁷ Fisheries Research & Development Agency, *Baekhap Aquaculture: Causes of Mortality and Countermeasures* 백합 양식: 백합 폐사 원인과 그 대책 (Fisheries Research & Development Agency, 1975).

⁵⁸ Gyunhyun Kim, "Prospects for This Year's Fisheries Propagation Projects 올해 수산증식사업의 전망," *Sae Eomin* 새어민 96 (1976), 106-109.

⁵⁹ Pyeongam Bae, "Shellfish Aquaculture Management in May-June: Technical Guide for the Fishing Village Saemaul Project 5-6월의 패류양식관리: 어촌새마을 사업기술 안내," *Sae Eomin* 새어민 97 (1976), 65-67; Pyeongam Bae, "Shellfish Management in February: Managing

In response to the mass mortality of baekhap, the government provided research funding to identify the causes of the die-offs and to support the recovery of the aquaculture industry. This funding was distributed to a range of institutions and researchers tasked with conducting scientific investigations into the environmental and biological conditions of baekhap farming. One such institution was the Gunsan Fisheries Research Institute 군산수산연구소, which carried out numerous experiments with government support. From 1975 to 1981, the Institute conducted a long-term study analyzing environmental factors in Buan Bay, then a major baekhap farming region, and comparing them with unaffected sites in Seosan-gun, Chungcheongnam-do. The study found that even after resting the grounds and implementing environmental improvements in 1981, baekhap die-offs recurred. Moreover, similar environmental conditions produced different outcomes: some sites experienced renewed mortality while others remained unaffected, indicating that no single environmental factor could fully account for the phenomenon. Parasitic infections also defied straightforward solutions, since mortality tended to increase with stocking density but could not be consistently prevented.⁶⁰ Despite ongoing research efforts through the early 1980s, no fundamental solution was found to overcome the structural vulnerabilities of baekhap aquaculture.⁶¹

Baekhap aquaculture entered a steep and irreversible decline. Production dropped sharply after 1975 and fell to only 751 tons by 1978. Throughout the 1980s and early 1990s, annual yields continued to dwindle, averaging about 290 tons between 1980 and 1993. This level was far too low to be regarded as the result of sustained commercial aquaculture.⁶² As baekhap aquaculture declined following the mass die-offs of the mid-1970s, attention along South Korea's west coast shifted toward large-scale land reclamation. In January 1978, the government announced plans to transform the southwestern coastline into a major industrial belt, marking a new phase of coastal development. Whereas the 1970s had been defined by the rise of heavy industry along the Gyeongbu corridor, the 1980s were characterized by the construction of coastal industrial complexes along the West and South Seas. In August 1978, the Ministry of Agriculture and Fisheries presented a large-scale

Baekhap Farms and Expediting Oyster Harvesting 2월의 패류관리,” *Sae Eomin* 새어민 105 (1977), 73-74.

⁶⁰ Saengdong Lee et al. “Basic Studies on the Habitat Environment and Mortality of Baekhap 백합의 서식환경 및 폐사에 관한 기초조사,” *Technical Report of Fisheries Research & Development Agency* 국립수산진흥원사업보고 62 (1985), 55-75.

⁶¹ Seh Kyu Chun et al. “Basic Studies for the Production of the Hard Calm *Meretrix lusoria* (RODING) in Jeonbug Farming Area 백합 생산을 위한 기초조사,” *Research Report of Fisheries Research & Development Agency* 수진연구보고 26 (1981), 7-36.

⁶² Office of Fisheries, *30-Year History of the Office of Fisheries* (note 28), 329-330.

initiative, developed jointly with private enterprises, to reclaim tidal flats at 59 sites along the southwest coast, creating more than 635,000 ha of new farmland.⁶³

As plans for reclamation progressed, the value of tidal flats began to be reimaged. Once regarded as productive zones for baekhap seed cultivation and aquaculture, these coastal areas were increasingly seen as sites for industrial and agricultural expansion. The expansive tidal flats of the West Sea, previously considered lucrative for shellfish farming, came to be evaluated instead for their shallow waters and suitability for development. These areas, which had been designated as protected baekhap seed production zones, were later incorporated into plans to expand the coastal industrial complex in nearby Gunsan. As the notion of a “West Coast era” gained traction in the 1980s, these tidal flats were reframed as gateways for trade with China. Under the Saemangeum Reclamation Project 새만금 간척사업, even lands that had once been legally protected for aquaculture were eventually dredged and converted into solid ground. The project planned to reclaim a total of 40,100 hectares of tidal flats for use as farmland and industrial sites. This area was equivalent to about two-thirds the size of Seoul (approximately 605 km²).⁶⁴ The name “Saemangeum” combined the first syllables of nearby place names in Chinese characters, and it conveyed the idea of a “new golden land,” symbolizing how a region once valued for its productivity through baekhap aquaculture was redefined under a new developmental vision.⁶⁵

Conclusion

This study has examined the trajectory of baekhap aquaculture during the Park Chung Hee administration. Baekhap farming emerged unexpectedly in the mid-1960s as a significant fisheries initiative, propelled by a sudden export boom to Japan and reinforced by government investment. The designation of natural seed grounds as “protected waters” was intended to secure a stable supply of clams and to generate profits through aquaculture, and the expansion of the baekhap project depended heavily on their designation and management. As marine pollution

⁶³ “The Map Will be Changed: 630,000 ha of Reclamation Planned for the Southwest Coast 지도가 바뀐다 서남해안 63만ha 간척,” *Kyunghyang Shinmun*, 1978. 8. 19.

⁶⁴ For the development plans of the Saemangeum Reclamation Project, see Nong-eop Jinheung Gongsa, *Environmental Impact Assessment Report for the Comprehensive Reclamation and Development Project in the Saemangeum Area* 새만금지구 간척종합개발사업 환경영향평가서 (Nongnim Susan-bu, 1989); For changes in fishing communities during the course of the Saemangeum Reclamation Project, see Han-hui Ham et al., *An Unfinished Record: The Saemangeum Project and the Fishers* 미완의 기록: 새만금사업과 어민들 (Areuke, 2013).

⁶⁵ Chul-hwan Koh, Jongseong Ryu, and Jong Seong Khim, “The Saemangeum: History and Controversy 새만금: 역사와 갈등,” *Journal of the Korean Society for Marine Environmental Engineering 한국해양환경·에너지학회지* 13:4 (2010), 327-334.

intensified and mass die-offs occurred in 1975, however, the protected waters lost much of their original significance within the development project and were eventually redefined as spaces for reclamation.

This paper has not sought to argue that the Park Chung Hee government placed the conservation of the environment above all other values. Rather, by tracing the shifting trajectory of a single initiative, it has aimed to provide a vantage point for reassessing the nature of development under Park's rule, in line with recent studies that emphasize the interwoven relationship between conservation and development. The baekhap project was neither the product of a fully orchestrated state plan nor was its collapse entirely determined by deliberate policy. Instead, both its rise and decline were shaped by contingent and often unexpected factors, including the baekhap's materiality. In this respect, the case complicates the conventional framework of the Park regime's "destructive development." That framework retains validity, since factories in coastal industrial zones frequently resisted or avoided providing compensation for fisheries damage, but it does not fully capture the complexity revealed in this study.⁶⁶

Among development projects that sought economic profit from natural resources, some also incorporated elements of management and regulation, such as the designation of "protected waters." Examining these areas in future research would provide valuable opportunities to explore the varied features of development planning during the Park Chung Hee era. One example is Hallyeohaesang National Park 한려해상국립공원, designated in 1968, which was initially criticized by the media for being established without proper site evaluation.⁶⁷ While the area did possess scenic and cultural value,⁶⁸ its national park status also functioned to protect oyster farming zones as South Korea prepared for shellfish exports to the United States. In 1972, the country signed a sanitary agreement with the United States and established a marine environmental monitoring center in Chungmu (present-day Tongyeong).⁶⁹ A 1971 U.S. inspection report quoted a Korean official stating: "The area is free from any industrial complex which might adversely affect the designated

⁶⁶ Heon-Gyu Kim et al, *Nature Conservation to Survive* 살아남기 위한 자연보호 (Jeonpa Gwahaksa, 1977). 78.

⁶⁷ "One Report, One National Park 보고서 하나로 국립공원," *Maeil Business*, 1968. 8. 8.

⁶⁸ Jiyoung Kim, "The Introduction of the National Park System and the Territorialization of National Nature in Korea: Practices of the Modern View of Nature and Spatial Construction Strategies for Protected Areas, 1920s–Early 1970s 한국의 국립공원 도입과 국토자연의 영토화: 1920-70년대 초 근대적 자연관의 실천과 보호구역의 공간 구성 전략," *Journal of the Korean Geographical Society* 대한지리학회지 60:2 (2025), 215-239.

⁶⁹ "Agreement Between the Government of the Republic of Korea and the Government of the United States of America on the Sanitary Treatment of Shellfish 대한민국 정부와 미합중국 정부 간의 패류의 위생적 처리에 관한 협정," Cabinet Meeting Agenda Documents, 1972.11.17, BA0084687, National Archives of Korea.

growing areas. This location has been designated a national park by the Korean Government to prevent encroachment by industrial development.”⁷⁰

The case of baekhap aquaculture also contributes to the recent “oceanic turn” by drawing attention to the experiences of fishers who took part in development projects. The oceanic perspective, an approach in the global historiography of science that emphasizes the sea as a critical site for uncovering overlooked yet vital elements in the making of modern science, proves particularly useful for reassessing these entangled relationships.⁷¹ As Toshihiro Higuchi a historian, has shown in a study associated with the “oceanic turn,” the sea could be perceived in entirely different ways. For operators of the nuclear ship Mutsu, it was simply a flat surface for movement, while for scallop fishers, it was farmland.⁷² This perspective, which emphasizes how the meaning of the sea varied depending on those who engaged with it, resonates with the case of baekhap aquaculture. A similar dynamic appears in this study, showing that even within the same community, fishers remembered and experienced baekhap aquaculture differently.

Capturing such voices remains an important task. As this case has briefly illustrated, capturing the voices of fishers by uncovering their diverse memories and experiences of development and the environment can also extend recent scholarship on the interwoven relationship between conservation and development, and it will remain an essential task for future research on fisheries-related projects. Although this study has only briefly addressed them, it has shown that fishers’ experiences were not uniform and cannot be reduced to simple categories of victimhood. Some recalled litigation against Honam Oil Refinery, supported at times by state authorities, while others attributed the collapse of aquaculture to imported seed stock, and still others built large, state-supported enterprises. As this case has illustrated, uncovering the diverse memories and experiences of development and the environment can extend scholarship on the interwoven relationship between conservation and development, and it will remain an essential direction for future research on fisheries-related projects.⁷³

These variations are particularly striking when comparing different regions. Residents near the Honam Oil Refinery experienced direct pollution damage and

⁷⁰ J. D. Clem and D. A. Hunt, *Evaluation of Shellfish Sanitary Control Program in Korea, 1971* (U.S. Department of Health, Education, and Welfare, 1971), 31.

⁷¹ Stefan Huebner, Nadin Heé, Ian J. Miller, and William M. Tsutsui, *Oceanic Japan: The Archipelago in Pacific and Global History* (Honolulu: University of Hawai‘i Press, 2025), 1-35; See also, David Armitage, Alison Bashford, and Sujit Sivasundaram, eds, *Oceanic Histories* (Cambridge: Cambridge University Press, 2017).

⁷² Toshihiro Higuchi, “Mutsu Adrift: A Nuclear Ship, Scallop Growers, and the Inescapable Ecologies of Mutsu Bay,” *Oceanic Japan: The Archipelago in Pacific and Global History* (Honolulu: University of Hawai‘i Press, 2025).

⁷³ “First Compensation Ruling for Oil Pollution 폐유공해 첫 배상 판결,” *Maeil Business*, 1975. 2. 8.

pursued litigation against the company, yet their claims were at times supported by the OOF and local governments. This indicates that the situation cannot simply be understood through the binary of state versus community. By contrast, fishers in Buan, Jeollabuk-do, remembered the collapse of baekhap aquaculture differently. In retrospective accounts, many attributed the industry's decline and the loss of commercial viability to parasitic infections allegedly introduced through seed baekhap imported from Japan by the Agriculture and Fishery Development Corporation. In interviews conducted in the early 1980s, they recalled that as late as 1973, about seventy households had earned roughly 20 million won annually from baekhap farming. They emphasized, however, that mass mortality began after Japanese seed stock was introduced later that year. For many, this episode became emblematic of governmental failure, as they expressed frustration that even a decade later the authorities had not provided a clear explanation for the die-offs.⁷⁴

Other accounts complicate the picture further. Yang Su-heung (楊洙興, ?-?), who managed a large farm in Seocheon, Chungcheongnam-do, recalled that baekhap aquaculture produced nearly nine times the income of rice cultivation. His farm harvested fifty tons in its first year, generating \$11,000 in revenue, and in 1968 it was selected for a government program to raise farmer and fisher incomes, allowing him to expand operations with state subsidies. By then he managed a seventy-five-hectare farm, equivalent to more than a hundred soccer fields. In short, Yang was both a fisher and an entrepreneur. Newspapers reported on his trip to Japan in 1973 to survey markets, underscoring his role as the owner of a sizable enterprise. In 1974, he was elected vice-president of the Korea Shellfish Promotion Association, which managed the export and import of shellfish. This association played an active role in promoting the import of seed clams to address chronic shortages. While many fishermen in Buan later remembered the collapse of baekhap aquaculture as the result of government mismanagement and the introduction of diseased Japanese seed stock, these memories must also be understood in light of the actions of aquaculture entrepreneurs like Yang, whose initiatives shaped the industry's trajectory in ways that went beyond government policy alone.⁷⁵

⁷⁴ “From Golden Baekhap Farms to a Dead Sea: 1,400 ha in Buan 백합의 황금양식장 죽은 바다로 부안 1400 ha,” *Dong-A Ilbo*, 1983. 7. 2.

⁷⁵ Suheung Yang, “Baekhap Aquaculture Yields Nine Times the Income of Rice Farming” (note. 26); “Business Briefs 재계 단신,” *Maeil Business*, 1973. 9. 14; “Regular General Meeting 정기총회,” *The Joongang*, 1974. 2. 1; “Guidelines Issued to Member Companies Recommended for Hard Clam Seed Imports 백합종패 수입추천 회원사에 요령시달,” *Maeil Business*, 1973. 11. 16.

Abstract

This paper examines the relationship between development and conservation in South Korea from the mid-1960s to the late 1970s through the case of hard clam (baekhap) aquaculture. While the Park Chung Hee era is often characterized by “destructive development” that entailed environmental degradation, this study shows that some projects, such as the designation of “protected waters,” sought to manage nature in the pursuit of sustainable economic gains. Following the 1965 fisheries agreement with Japan, a sudden export boom in baekhap led the government to promote aquaculture as a major national initiative. Because artificial propagation was not yet possible, natural seed clam grounds were designated as “protected waters” to secure a stable supply. By the mid-1970s, however, the industry faced severe crises due to marine pollution from expanding coastal industrial complexes and the nationwide mass die-off of 1975. After the collapse of baekhap farming, coastal areas once designated as protected waters were reimagined as sites for large-scale reclamation projects. This study argues that the era’s nature-conserving measures were ultimately temporary and palliative, and it underscores the varied experiences of the fishers involved, suggesting the need to expand research on the intertwined relationship between conservation and development by attending to the perspective.

Keywords: baekhap, hard clam, development, conservation, aquaculture