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The U.S. Bureau of Reclamation's Role in Water Management and Nation Building in the Mekong Valley, 1945–1975

DAVID A. BIGGS

ABSTRACT The Bureau of Reclamation's engineers played a substantial role in the history of American modernization efforts in Southeast Asia by planning and building dams that have had long-term social and environmental consequences for water management in the region. Bureau staff not only coordinated dam designs, but also trained hundreds of local engineers and actively contributed to the growth of public and private sector institutions in the region. They facilitated the refocusing of American development strategies in Asia from Depression era programs in India and China to the relatively uncharted, violently contested terrain of the Mekong Valley. These activities have had lasting, often problematic effects not only on the water environment but also on contemporary development initiatives in the region.

WITH THE MEKONG RIVER running at flood stage in October 1968, Peter T. White, covering the Vietnam War for *National Geographic*, traveled upstream with Lyle Mabbott, the Bureau of Reclamation's Chief Engineer for the Pa Mong Dam Site near Vientiane, Laos. Using an outboard motorboat, they set out against the river's fast-moving, turbid waters to the dam site. Mabbott, a veteran of the bureau from Dubois, Wyoming,

with experience designing dams in Arizona and the Blue Nile, drove the boat through monsoon downpours before they reached the muddy shores of the test site on the Thai side. Under the intense mid-morning heat, they climbed a steep slope some 200 feet above the river before stopping at a sign reading "Pa Mong Dam Site: Hole 108." There, they met Thai technicians using a Swedish drill powered by a clanging Volkswagen motor to bring up three-inch corings of sediment for testing.

"Samples of siltstone," Mabbott explained. "You've got to seal them fast, in hot wax, or they'll disintegrate. We send them to Denver for analysis. You can't design a dam until you know the geology" (White & Garrett, 1968, p. 752). Once delivered to the Bureau of Reclamation's Denver Hydraulics Laboratory, the corings would determine the height and dimensions of the giant dam. Mabbott explained that he expected preliminary investigations finished in 1971, designs completed in 1972, construction finished in 1976, and power plants operational in 1988 . . . twenty years and a billion dollars would produce the world's largest multipurpose dam and reservoir at the time.

However, there were problems even then with this classic image of American modernization, problems that had plagued Pa Mong and other bureau projects since 1952. A Lao economist visiting Hole 108 on that day explained to White that Pathet Lao guerillas, aided with recoilless rifles and a few thousand North Vietnamese reinforcements, had fought their way to within ten kilometers of the site on the Lao side and had taken shots at engineers and technicians working there. "Our fighter bombers are hitting the enemy hard," a Lao general in Vientiane explained to White. "But he infiltrates more troops, and heavier weapons" (White & Garrett, 1968, p. 753)

Such problems were indicative of a broad resistance to American nation building efforts across the region as North Vietnam, the Pathet Lao, and other groups allied with China and the Soviet Union employed their own development counternarratives and reacted with military force to thwart such projects as Pa Mong Dam.¹ Ultimately, suppressing the resistance proved too costly; bureau engineers headed home in 1972, ending their agency's association with Pa Mong and the Mekong Project. By 1975, Hole 108, along with a sprawling infrastructure of American bases, lay mostly abandoned, and the sounds of clattering machinery fell silent.

Despite the abandonment of these projects, the bureau contributions to modernization in the Mekong region were significant and continue to

¹Such attacks on project sites were common throughout the Mekong region at this time, supporting Jefferson P. Marquis' observation that such insurgent attacks were intended to prevent any real synthesis between competing American modernization ideologies and thus further destabilize allied local governments (see Marquis, 2000, p. 81).

influence present-day water management decisions in the region. This essay examines this legacy in more detail, considering the historical context that explains how a domestic American engineering agency came to be involved in Asian projects and the role that the bureau played in fostering public and private partnerships associated with the Mekong Committee and dam projects in the region. The bureau's engineers and officials helped transplant its "culture of irrigation" as a less-noticed part of American nation building campaigns more typically articulated by American social scientists and military advisors. The unique circumstances of the Cold War in Indochina and America's growing commitment to funding development there created an unprecedented moment for bureau engineers to partner with local governments and firms; this produced a trend, especially in Thailand, where technocratic national agencies incorporated the bureau's "culture" into their own public works and irrigation departments. This essay concludes with an epilogue to the bureau's brief involvement in the region, considering how local adoption of past modernization efforts may soon produce the projects first surveyed by bureau staff in the 1950s.

THE BUREAU'S ENTRY INTO ASIA

Although the Bureau of Reclamation, as a domestic agency of the Department of the Interior, was not intended to advance programs overseas, it nevertheless succeeded from 1930 in pushing an American style of irrigation politics first to India and China in the 1930s and later to Southeast Asia. Former Commissioner Floyd Dominy described the bureau's foreign training programs as "breaking trail for US companies," indoctrinating local officials in preparation for work to follow (Westcoat, Smith, & Schaad, 1992, p. 58). One bureau historian related a similar view of the bureau's move into international projects, stating that by 1930, bureau surveyors had surveyed and claimed most potential dam sites in the United States so they moved westward across the Pacific to new basins in China, India, and the Middle East (R. Wingate, personal correspondence, 7 April 2005). The Bureau of Reclamation's work in Asia thus began with efforts in the 1930s to train foreign nationals and survey foreign sites at the request of local governments and groups struggling with decolonization and the Great Depression. Completion of the Hoover Dam in September 1935 catapulted its designers in the bureau to international fame, and immediately engineering agencies in the Middle East, India, and China requested assistance to select comparable sites in such basins as the Damodar, the

Indus, and the Yangtze (Simonds, n.d.). Although bureau engineers typically restricted their involvement in such places to technical advising, they nevertheless played a formative role in promoting what Latham has described as an ideology of modernization specific to the politics of irrigation (2000, p. 17).

The most effective means of promoting bureau “culture” overseas was the bureau’s foreign trainee program and its tours for foreign officials visiting sites such as Hoover and Grand Coulee dams. Just after completion of the Hoover Dam, the bureau’s Denver Hydraulics Laboratory initiated a long-term training program for a dozen Chinese engineers interested in construction of a large concrete dam across the Yangtze River near the present-day Three Gorges Dam. As wartime conditions permitted from 1939 to 1944, more engineers and officials arrived from Asia as well as the Soviet Union, India, and the Middle East. With U.S. and Chinese forces expanding their control of the Asian mainland in 1944, John L. Savage, Chief Design Engineer for Hoover Dam, traveled to China to direct initial surveys for a proposed Three Gorges Project (National Archives and Records Administration—Denver [NARA-D], 1945). Ekbladh’s recent essay (2002) on the Tennessee Valley Authority (TVA; 2002) suggests that bureau programs were further augmented by support from the Rockefeller Foundation and the State Department to promote development of a TVA-like Yangtze Valley Authority to support rural development through construction of multipurpose dams. The Rockefeller Foundation paid for dozens more Chinese officials to visit TVA while the Office of War Information in China distributed some 50,000 copies of Lilienthal’s *TVA: Democracy on the March* in 1944 to build popular support for American postwar development (Ekbladh, 2002, p. 346).

Such an intensive campaign presaged the intense competition American wartime intelligence units and President Roosevelt foresaw in winning over Asian peasants who they viewed as extremely susceptible to counter-narratives of modernization offered by Mao Zedong’s Chinese Communist Party and the Soviet Union. Roosevelt had, since 1940, recognized a need to gather more information about such topics as population, irrigation, education, and public health in Africa and Asia in anticipation of preventing future conflicts from arising among several billion people displaced by the war. Roosevelt’s top-secret M Project, led by anthropologist Henry Field, produced over 600 reports on existing irrigation projects and settlement efforts in various countries including the Soviet Union, Nazi Germany, and Japan. Copies of Field’s summaries went out to the Secretary of State and heads of all government departments, including the Department of the Interior (Likness, 1996). After World War II, Truman

continued the M Project and in 1949, folded it into his Point IV Program. The defeat of Chiang Kai Shek's Nationalist Army in the Yangtze Valley in 1947 and the gradual expansion of the Chinese Communist forces in 1948 led to a major shift in American strategic interests in postwar reconstruction from projects concentrated in China and Japan to the countries on China's periphery. Truman's Point IV speech, given at his inauguration on 20 January 1949, offered, in his words, "a bold new program for making technology available to the peace-loving nations of the world," that is, containing the expansion of China through modernization of its periphery (NARA-D, 1949a).

The immediate reaction of many bureau officials to the changing situation in China and the reorientation of American efforts to many more countries in the Chinese periphery was at first reluctant. They initially turned down State Department requests to accept hundreds more trainees from Southeast Asia; the bureau had no congressionally mandated budget to pay for their training, especially not if they were to work as the few dozen Chinese engineers had before 1947 for four-month periods or longer. The bureau had begun accepting short-term visitors from Southeast Asia in 1946 when a dozen Thai visitors were guided by bureau staff to several dams and the Hydraulics Lab. A year later, that number of short-term visitors had increased to a dozen Thai visitors per month, suggesting that the bureau was already accommodating a significant increase in short-term visitors before Point IV (NARA-D, 1949b). Following Point IV, exactly what Truman's promise of "making technology available" meant for bureau operations was "in the realm of pure speculation" according to P. T. Butler, Director of the Bureau's Design and Construction Division. In a memo to his staff in May 1949, he surmised that "Point IV" amounted to a "pooling of know-how" among the nations of the world and the United Nations:

As nearly as I can tell from going through the literature, what is meant by cooperation is simply that these other countries will cooperate with us by letting us help them. It is evidently intended that these countries will finance their own projects and that the extent of United States help will be in the technical phases of planning, designing, and constructing these projects. (NARA-D, 1949a)

Such an interpretation was in keeping with the bureau's approach to irrigation in the United States, not interfering with private business or pushing political agendas but carrying out state-of-the-art design and overseeing construction. However, his comment that cooperation involved "other countries letting us help them" suggested that the bureau expected no resistance from the other country as they transported their technocrat-

ic “culture” abroad. Furthermore, Point IV represented a major shift; the bureau would not only be training foreign technicians but, more important, sending its engineers abroad. With State Department funding, bureau staff began conducting field surveys in Southeast Asia for the governments of Thailand, the Philippines, and Indonesia. By late 1950, the bureau had formed “foreign project investigational units” of individuals who visited select countries and assembled all available data necessary for planning future projects (NARA-D, 1950).

Despite the United States’ strategic interest in reconnaissance of potential projects in Southeast Asia, such projects were rarely unilateral or bilateral affairs at the time. The Truman Administration strongly supported the United Nations (U.N.) as the appropriate agency for coordinating such movements of technical personnel. This had the effect of lessening the financial burden of U.S. contributions at the same time that it synchronized the bureau’s modernization strategies in irrigation and dam construction with many other private and public engineering firms from Europe and Asia. Whereas U.S. companies such as DMJM and Bechtel played a central role in postwar construction in Japan, a host of new Japanese and European companies, including Nippon Koei and SOGREAH (France), were encouraged to bid for contracts in Southeast Asia as a means of putting many engineers, some former colonial civil servants, back to work (NARA-D, 1948). The U.N. agency that coordinated postwar reconstruction in Asia was the Economic Commission for Asia and the Far East (ECAFE), set up in 1947 with its headquarters in Shanghai. Reflecting the more general shift in U.S. priorities away from China in 1947, its headquarters moved to Bangkok in January 1949 (United Nations Economic and Social Commission for Asia and the Pacific, 2006).

The major reason, however, why foreign consulting firms such as SOGREAH may have adapted the bureau’s culture of engineering was the overwhelming flow of funding and military contracts available from the U.S. after 1950. The U.S. commenced major military and civil operations in Thailand and Indochina following the signing of Mutual Defense Assistance agreements in 1950; but it was not until the Viet Minh defeat of the French at Dien Bien Phu in 1954 that new funds for civil projects escalated to levels never before imagined for the region (“Mutual Defense,” 1954).

The U.S. Operations Missions [USOM] quickly grew into major governmental nerve centers for American nation building efforts in Southeast Asia. USOM staff coordinated funding, contracts, and associated military or security actions surrounding specific projects. Attached to American embassies in the region, the missions (especially USOM—Bangkok) facilitated a growing exchange from 1955 to 1975 between bureau engineers, visiting

U.S. officials, private contractors, military officials, and local staff. USOM-coordinated assistance brought about unprecedented levels of spending for public works programs in each of the riparian countries. Memos from the South Vietnamese Public Works Minister in 1957 complained that the USOM-sponsored increase in their annual budget from 20 million piasters in 1954 to 800 million piasters in 1957 had caused severe shortages in trained personnel and was causing widespread corruption (Vietnam National Archives # 2, 1957). Especially in the 1950s, the USOMs often relied on colonial-era enterprises and technicians to handle the added work of training local staff and operating the fleet of dredges, bulldozers, and other equipment arriving monthly (NARA, 1956b).

Another interesting development, especially in Japan, was the transformation of U.S. companies' branch offices as an increasing pool of Asian and Asian-American employees managed offices and projects in Tokyo, Bangkok, and Saigon. U.S. Consultants, for example, recruited American-born Japanese to manage its Japanese office. Saburo Sugitani, born and raised in Venice, California, worked as an inspector-engineer and administrator for the company in Tokyo in 1951; by 1956, he had begun traveling to Vietnam and Thailand to consult on new infrastructure projects there (NARA, 1956a).

Not far beyond the limits of such construction projects was an expanding presence of U.S. covert and military forces that, since 1950, tended to support authoritarian local governments, thus creating one of the most unusual working environments for bureau engineers. Mabbott's recollection to Peter White of fighter bombers attacking Pathet Lao forces just beyond the Pa Mong test site reminds us that the Bureau of Reclamation's situation in Asia, particularly in the Mekong Valley, was very deeply ensconced within surrounding military operations. Bureau engineers such as Mabbott, through their dealings with U.N. agencies and USOM—Bangkok, were conscious of their efforts being read as part of greater American ambitions, even though they spent most of their time far from the battlefields and the public eye. It is most likely, because senior bureau staff such as Mabbott had extensive interactions with U.S. military and high-level USOM personnel, that much of the American archival evidence surrounding these projects has yet to be declassified. Thus, it is still difficult to ascertain just how closely bureau engineers figured into U.S. military or surveillance operations in the region.²

²For USAID records on Vietnam and Thailand see RG 286: Records Of The Agency For International Development. As of July 2005, most of USAID's records on Thailand and Vietnam, especially those concerning dam construction, are still classified at the National Archives and Records Administration in College Park, Maryland.

The link between the bureau's engineering culture and U.S.-backed security initiatives is perhaps best illustrated with the creation of the Southeast Asia Treaty Organization's Graduate School of Engineering in Bangkok in 1959. Maurice Albertson, a hydraulics professor at Colorado State with close ties to the bureau's Hydraulics Lab and TVA, carried out the first feasibility studies for the school at the behest of the State Department in 1954. After the school was established in 1959, he served as a campus coordinator, advising the new administration (Julien & Meroney, 2003).³ Thus, the work of training Asian engineers shifted from bureau offices in Colorado to a facility not far from the air-conditioned hallways of ECAFE, the Mekong Committee, and USOM—Bangkok.

BUREAU PROJECTS, THE MEKONG COMMITTEE, AND COMPETING IDEAS OF MODERNIZATION

The best-known creation of this era, one in which the bureau played a central role, was the Mekong Committee. Established in 1957 under the auspices of ECAFE with approval from four of the six riparian nations, the Mekong Committee was intended to manage a kind of international TVA on the lower section of the river. Bureau engineers traveled to the area beginning in 1952 and conducted some of the first preliminary studies on potential dam sites. The U.S. International Cooperation Agency (ICA), a successor to Point IV, signed a special agreement with the four riparian countries in 1955 to conduct more extensive mapping and geological surveys. A team of bureau engineers and surveyors arrived from Washington, D.C., in December 1955 and, together with U.S., Cambodian, Lao, and Thai military escorts, they visited Pa Mong and several other sites. Located in a narrow gorge where the Mekong crosses through the northwest rim of the Khorat Plateau, Pa Mong presented the most ideal site for one large dam. Bureau geologists recommended creating a single large reservoir with five lobes flooding the mainstream and four tributary valleys, creating what would have been the largest reservoir in the world (U.S. Bureau of Reclamation and USAID, 1972, p. II-3).

They published a thirty-six-page bilingual report in English and French that focused on Pa Mong as the ideal site for a dam project larger than

³The school was renamed the Asian Institute of Technology in 1967, and since then has operated independently of the Southeast Asia Treaty Organization, supported instead by the Thai government.

Hoover Dam (perhaps a replacement project for Three Gorges; Schaaf and Fifield 1963, pp. 84–89). It also recommended that ICA and ECAFE fund more thorough campaigns to map the valley and install state-of-the-art hydrologic monitoring systems in the basin. A collection of donor nations and contracted private firms responded to these calls. The Canadian government flew aerial photography surveys and bureau staff conducted more site surveys in Thailand and Laos (U.S. Department of the Interior, 1956, p. 20). The Japanese government supported Nippon Koei's investigations of dam and irrigation sites in Cambodia and Vietnam, and Australia's Snowy Mountains Hydro-Electric Authority conducted geological reconnaissance at the Sambor dam site in Cambodia as well as assisting bureau staff at Pa Mong (Sargeant & Moye, 1960, 25).

Following these bureau surveys, the establishment of the Mekong Committee in September 1957 followed with a carefully orchestrated visit by General Wheeler, former Chief Engineer of the U.S. Army Corps of Engineers, in December 1957. Wheeler's traveling cohort included some of the most famous figures in international engineering at the time: Kanwar Sain, Chairman of India's Central Water and Power Commission; John W. McCammon, former General Manager of Quebec Hydro; G. Duval, Director, SOGREAH, France; and Yutaka Kubota, President of Nippon Koei, Japan. The group traveled to several proposed sites in a series of day-long boat trips on the river. On one of these days, they traveled to the Pa Mong site. Wheeler described his trip on the river that day later to American reporters as a kind of modern-day incarnation of the French explorers, Marquette and Joliet, floating down the Mississippi:

There were no maps of the country, we had to make them. Nobody had any data on river flow, or even any idea how to keep data. What I saw was a truly virgin river. Such sights disappeared in our country long before I was born. (Black, 1969, p. 138)

The irony in this allusion to early American exploration was that Wheeler and his colleagues were steered to each site by bureau engineers who had worked in the area for several years already. In one sense, however, Wheeler's story was true; there were few historic hydrologic data in 1957. Only the most rudimentary gauges existed in scattered parts of the watershed, and wartime disruptions, particularly the First Indochina War, had caused further gaps in record keeping. Wheeler recommended ICA and ECAFE install state-of-the-art hydrologic monitoring systems to begin collecting data for preliminary studies (Black, 1969, p. 138).

The intended image of the Wheeler Mission as an international, cooperative effort is a perfect illustration of the transition in American mod-

ernization strategies at the time from containment in 1949 to what Christina Klein has called a “global imaginary of integration” in 1957, a pedagogical emphasis on Americans such as General Wheeler “looking outward” and working in collaboration with peers such as Kanwar Sain and Yutaka Kubota (Klein, 2003, pp. 25–27). The difficulty with this integrative model, however, was that as in other parts of the world at the time, it required considerable applications of military and police force to protect such a spectacle from local attacks.

Not far below the surface of such displays, too, were the realities of uneven power and influence within this multinational group of Americans, Japanese, Canadians, French, Thais, Australians, Vietnamese, Indians, and Nationalist Chinese. The bureau took advantage of its proximity to the center of American influence to stake out work in northeastern Thailand at Pa Mong and other tributary sites, whereas SOGREAH engineers returned to work with old colleagues in Saigon and Japanese engineers worked in neutral Cambodia. An overview of what bureau publicists were calling the Mekong Scheme in 1968 demonstrates both this global imaginary at work in public and a more hierarchical reality of river work in private. Lyle Mabbott described Pa Mong to a Mekong Committee meeting in 1968 as a “once in a lifetime” project, being the largest multipurpose dam in the cascade. This American-built dam was then to function in concert with an Australian/Japanese-built dam at Sambor, Cambodia, and a Japanese-built dam at Tonle Sap Lake that would then regulate water levels there and prevent downstream flooding into the delta region of Vietnam (Jenkins, 1968, p. 458).

The problem with this utopian vision of integration was that, since decolonization in 1945, historical distrust between the riparians and escalating guerilla warfare in the region prevented any real talk of such close international cooperation. Controlling the river’s flow in the manner presented by the Mekong scheme gave the ultimate advantage to the owners of the upstream dam, Thailand and Laos. The idea of Khmers, Thais, Laos, and Vietnamese working together in an international TVA-like authority was well beyond the realm of possibility. As the war escalated in Vietnam after 1965, President Johnson nevertheless pushed this integrative vision to its farthest extent as a counterweight to his massive deployment of troops and unprecedented bombing campaigns over Hanoi. In a speech at Johns Hopkins in April 1965, he explained his decision to commence bombing in North Vietnam and simultaneously announced that he would seek \$1 billion from Congress toward construction of the Mekong Cascade that would “dwarf even our own TVA.” As a symbol of American commitment to peace and prosperity, he claimed that such towering construc-

tions, and not thousands of bomb craters, would be America's eventual "footprint" on the region. He then tapped his old friend and former architect of TVA, David Lilienthal, to visit the region and promote this multi-purpose, basin-wide development scheme (*Public Papers*, 1966, pp. 394–399).

Although recent scholarship has charted the rise and fall of American modernism through the activities of high-profile figures such as Johnson, Lilienthal, and Eugene Black, this essay considers the equally important but less discernible paths that bureau engineers followed in advancing their own modernization ideologies at the time.⁴ A focus on senior officials misses the more widespread exchanges that occurred between American technical advisors and local counterparts on a daily basis. By the time Johnson ordered U.S. troops to Vietnam, the Bureau of Reclamation had already escorted over 2000 engineers and dignitaries from Vietnam, Thailand, and Laos on its hydraulic tour in the U.S. Bureau engineers, usually working on contract to USOM—Bangkok and the Mekong Committee, continued surveys of dams and irrigation systems with increasing cooperation from these Southeast Asian returnees.

Bureau engineers and their local counterparts thus created their own path of modernization, deeply reliant on powerful government bureaucracies and simultaneously averse to public, political activity. There are certain similarities between what Marquis (2000, p. 90) calls an ideology of liberal nationalism among social scientists and bureau engineers like Mabbott who may have identified a similar form of regionalism implicit in various rural electrification and irrigation schemes. However, bureau engineers such as Mabbott rarely spoke publicly or acted as evangelizers of modernization. A fast-growing local professional and bureaucratic community, built around a core of bureau trainees, already had sold their own governments on the need to develop hydroelectric generating facilities; this left bureau consultants such as Mabbott free to work so long as insur-

⁴See Ekbladh (2002) for an account of the frustrations Lilienthal encountered as recounted in his published journals and private papers. Also, see Adas' (2006) recent work that suggests the oscillation between "peaceful" high-tech projects and violent military reprisal has been a longstanding fixture of U.S. foreign intervention. Along with Lilienthal, perhaps the biggest proponent of the Mekong Committee was Eugene R. Black. Black (1969) served as the third president of the World Bank from 1949 to 1962 and during his tenure emphasized bank support for the "project concept" and "national development plans" pushed by the original Mekong Committee. Following his retirement, he went on to help form the Asian Development Bank in 1966 as an attempt to deflect criticism of the World Bank as a U.S.-dominated institution. During the 1960s, he emerged as an active proponent of Asian regionalism, a strategy whereby more developed Asian countries such as Japan were to take an increasingly central role in investment and diplomacy in the development of the region.

gents, national governments, and more critical social scientists were held at bay. Furthermore, the promise of delivering electricity to a region that before 1957 had only minimal networks servicing very small downtown grids in the capital cities was one that few opponents to U.S. intervention could attack (ECAFE, 1958, p. 22). As political parties and social scientists increased their participation in debates over Mekong projects in the 1960s, bureau engineers and their colleagues gradually retreated to less conflicted tributaries and watersheds within Thailand. Whereas private firms such as Nippon Koei consulted on a variety of projects in the war zones, requiring brief visits to sites in Cambodia and Vietnam, bureau activities were limited in the 1960s to the "once in a lifetime" Pa Mong Dam and other projects in Thailand.

One of the first such projects was the Chainat Dam located on the Chao Phraya River. In 1905 a Dutch irrigation engineer hired by Thailand's Royal Irrigation Department (RID) identified the site, but no work commenced before 1945. In 1947, the Chief Engineer of RID applied for assistance from the World Bank and the bureau to implement this work; his engineers were among the first Thais to visit bureau facilities, and on their return to RID in 1949, the World Bank awarded the agency an \$18 million loan to design and build Chainat Dam. RID then invited the bureau to manage dam surveying, and two of its design engineers, M. E. Day and A. L. Ahlf, coordinated design and trained RID technicians. The Denver Lab coordinated laboratory analysis of soil cores and more work on a Greater Chao Phraya Project commenced in 1952. Day and Ahlf accompanied RID's chief engineer on other trips to eleven more sites in the basin, selecting one particularly ideal site on the Mae Ping river that 11 years later was inaugurated as Bhumipol Dam, Thailand's largest concrete dam (NARA-D, 1952; Yoder, 1957, p. 25).

Pictures (Figure 1) illustrate how closely bureau-trained engineers worked with their Thai colleagues on these projects. The training experience extended beyond assembly of specific components to management of a broader network of technicians, construction crews, and RID staff who then oversaw construction and operation of other dams. The dam, with all of its complex generating equipment and design features, is a prime example of what Latour and others refer to as a *quasi-object*, something that not only consolidated American forms into the local environment but something that simultaneously opened up new ways of organizing Thai engineers, water users, bureaucrats, and laborers (Latour, 1993, p. 54).

The potential for such projects to produce multiple, often unintended, social and environmental consequences was especially true at Bhumipol. After initial survey work concluded, four of the bureau engineers who



Figure 1 Photo No. 3: Bhumipol Dam and Powerplant: Contract YC-2: Soldering ends of joint windings of stator sections in Generator No. 2 (NARA-D, 1952).

worked on loan from the bureau quit and formed a private consulting firm called ECI. They and a staff composed of many RID employees then successfully bid for the World Bank contract to build the dam (AECOM, 2006).⁵ Thus, Bhumipol and other projects like it in Southeast Asia were instrumental in fostering the growth of American construction companies. Bhumipol, however, also produced troubling political and environmental problems for the Thai government; ECI's reliance on thin historical data resulted in a gross overestimation of water flow at the dam site in 1957. The Electrical Generating Authority of Thailand (EGAT) was frequently required to withhold water necessary for irrigation in the dry season to generate electricity as the proceeds from electricity sales repaid Thailand's international loans more quickly than sales from rice (Black, 1969, p. 142).

By the mid-1960s, evidence from other newly completed projects gave rise to growing concern from social scientists working with the Mekong Committee, also working as contractors for USOM's successor agency,

⁵ECI continued to flourish as a private corporation since its founding with the work on Bhumipol. In 2003, it was bought by another U.S. firm that in 2005 was in turn folded into the conglomerate AECOM.

USAID. The intended showcase project at Pa Mong quickly became a real and figurative battleground for those with competing visions of the region's future development. Social scientists challenged engineers on multiple fronts. One of first and best known critiques of bureau work came in 1962 from a report published by Gilbert White with support from the Ford Foundation. White, a geographer who had previously criticized the Army Corps of Engineers for its flood control structures in the United States, brought the question of how social and economic welfare was valued to the forefront of discussions about future funding of Pa Mong Dam and others in the Mekong Cascade. Beyond the potential of the dam to pay for itself through electric power generation, White introduced the "moral" requirement that the dam bring immediate and substantial benefit to people living in areas affected by it and the flooding of the reservoir. The estimated total number who would need to relocate from Pa Mong's reservoir varied from 230,000 to 480,000, and paying for such a massive relocation effort would substantially raise the overall cost of construction (University of Michigan Team for Pa Mong Research, 1982, p. 29; White, de Vries, Dunkerley, & Krutilla, 1962).

The White Report initiated a host of follow-up studies and conferences over the next decade that reflected the growing influence of social scientists in nation building efforts and the increasingly inescapable, political position that bureau engineers such as Mabbott occupied. Social science literature produced after the White Report covered a spectrum of development ideologies, from neotraditional, populist sentiments highlighting the "genius" of traditional water management schemes to ultra-modern reports arguing for computer-assisted cost-benefit analysis to better anticipate the social, environmental, and construction costs of new dams. A number of studies commissioned by USAID and the Rand Corporation criticized early bureau approaches but only for their lack of sophistication with regard to cost-benefit analysis. As dams such as Bhumipol and Nam Ngum (Laos) came online in the 1960s, later reports highlighted often serious social and ecological problems associated with them (University of Michigan Team for Pa Mong Research, 1982, p. iii).

By the time Peter White of *National Geographic* visited with Lyle Mabbott at Hole 108 in the summer of 1968, the combination of insurgent attacks in the countryside and growing social science critiques in print and in periodic ECAFE meetings effectively ended the bureau's participation in Mekong projects. As security conditions worsened in the region after 1968, the bureau continued its contract for Preliminary and Secondary Investigations at Pa Mong and then withdrew from Mekong Committee activities after 1972. Social scientists, particularly those funded by the Ford Foun-

dation, however, played a much greater role in directing Mekong Committee activity after 1972. This “takeover” of the Mekong Committee by social scientists, especially those who identified with more populist attitudes toward modernization, coincided with the large-scale and rapid withdrawal of U.S. military personnel from the region after 1972. The shift in focus for the Mekong Committee was also a response to the changing mood in Washington against the war in Vietnam and funding international dam projects. In a special 1972 report on regionalism and the Mekong Committee, the U.S. House Committee on Foreign Affairs revisited Pa Mong and questioned whether poorer countries like Laos could even afford the luxury of “monolithic concrete structures” that did not provide immediate economic benefits to the majority of the country’s poor, rural population (Huddle, 1972, p. 25).

Social scientists achieved their greatest influence over committee activities when international cooperation was at its weakest in the region in 1978. It was at this time that the committee commissioned the Nam Pong Post-Audit Study, a lengthy assessment of the social, environmental, and economic outcomes of a multipurpose reservoir sponsored by the committee in northeast Thailand. Nam Pong triggered the resettlement of tens of thousands of people from the old river valley to higher ground on mountain slopes. This in turn caused widespread and unregulated deforestation and subsequent depletion of the soils (Huddle, 1972, p. 93). The report was unusual in the lengths that it went to criticize the committee for contributing to “failures in human resource management” and “splitting command” over the project into a dozen different state agencies. Speculation in irrigable land below the Nam Ngum Dam in Laos also increased rather than decreased tenancy rates and rural poverty as military officers in Vientiane purchased title to the land from resettled farmers in exchange for protecting them to stay on the land and cultivate it (Jacobs, 1995, p. 108; Sluiter, 1993; Southeast Asia Technology Company Ltd., 1978).

ASSESSING THE RECLAMATION LEGACY: NEW “OLD” DAMS AND LOCAL VARIANTS ON MODERNIZATION

With the collapse of U.S.-allied governments in Saigon and Phnom Penh in April 1975, American-backed development in the region all but ceased. The river in 1975 became a heavily armed frontier between opposing Southeast Asian nations and their American (Thailand), Soviet (Vietnam and Laos), and Chinese (Cambodia) allies. With U.S. support, Thai-

land continued construction of its tributary projects and it continued to train staff at home and abroad. The Mekong Committee, based in Bangkok, evolved into an advisory organization and drafted a "Joint Declaration on Principles" in 1978 to outline more precisely how "reasonable and equitable use" would be determined in relation to proposals for future hydro projects (including Pa Mong) and smaller dams. Cambodia withdrew its membership from the Committee in 1978 and did not rejoin until 1991. In April 1995, improved regional relations produced a new agreement forming the Mekong River Commission in an effort to revive a plan for international basin management. Burma and China, however, remained conspicuously absent from these negotiations; the Chinese government has since embarked on its own plan to build a cascade of dams on the Upper Mekong (Lancang Jiang) and become a major player in an Asian Development Bank initiative called the Greater Mekong Subregion Program that has in a sense recaptured the old Mekong Committee emphasis on regional economic integration through its financing of privately contracted construction projects. Unlike the old Mekong Committee, however, the GMS Program does not fund or design large dams but instead funds complementary projects such as transnational highways, power grids, and power trading agreements that will bring about greater regional economic integration once the new dams come online (Asian Development Bank, 2006). Thus, the older, often opposed ideologies of modernization surrounding projects such as Pa Mong in the 1960's now appear to have relocated within these two basin development organizations while the business of building dams has moved silently into the domains of national investment and the private sector.

The Asian Development Bank, touted by Eugene Black and the Nixon Administration as an ideal replacement for American financing, has now successfully engaged individual governments and private companies in building new projects. The EGAT, once shaped by bureau advisors, is now cooperating with private Thai companies in negotiations to build, operate, and buy power from a proposed mainstream dam across the river in Yunnan, China ("China's Challenge," 1997). China is now in the midst of building its own cascade of twelve dams in Yunnan Province on the upper half of the Mekong River. In October 2005, new surveys commenced at the old mainstream projects in the lower valley, despite objections from many environmental groups and staff at the Mekong Committee. A trade journal announced that a newly-formed Thai agency, the Alternative Energy Development and Efficiency Department, is reviewing plans at Pa Mong and Sambor, and that a private Thai engineering firm, Panya Consultants, will conduct a 2.4 million dollar study revisiting a total of seven sites first

identified by bureau staff in 1952. (“News: Mekong hydro plants revived,” 2005). Furthering this process of privatization and renewed interest in dams on the Mekong mainstream, in March 2006, Prime Minister Shinawatra of Thailand pushed a nearly successful bid to fully privatize EGAT. This move would have fully privatized management of all dams in Thailand and further contributed to a fragmentation of control over river resources to private companies. The move was narrowly rejected by the Thai Supreme Court (“EGAT IPO Rejected,” 2006).

What then of the bureau’s legacy in these more recent developments? The deceptively obvious response is that the “footprint” Johnson envisioned bureau engineers delivering in 1965 is now being realized by a slate of mostly private and local firms. As the U.S. has returned to a nation building strategy of its own in Iraq, Asian firms and international agencies are now pushing earlier American-conceived projects that within ten or fifteen years may permanently alter the river’s role in local environments and economies. Local nongovernmental organizations and the Mekong Committee have continued to expand their activities generally in opposition to mainstream dams, but there is little prospect of them halting construction work in the near future. Such a “footprint” conclusion, however, presumes that American engineers had more agency in directing past development than actually existed. The image of Mabbott observing preparation of siltstone cores with a Thai technician, a Lao engineer, a Swedish drill, and a German engine reminds us that dam construction by the 1950s had become an extremely internationalized affair. The tangled web of international agencies, individuals, laboratories, and banks that came together to carry out work at a test site such as Hole 108 reflected an earlier American model of public–private interaction adopted and simultaneously modified by participating groups from Japan, Europe, Thailand, Vietnam, and now China.

What current literature on American modernization campaigns in Southeast Asia has yet to consider, however, are the ways that past nation-building efforts fit (or conflicted) with deeper, more autonomous Thai, Vietnamese, and Chinese ideologies of modernization. In Thailand, for example, King Chulalongkorn (r. 1868–1901) established a Western-style educational institution that produced irrigation engineers and military surveyors before 1900 in a bid to modernize the bureaucracy and maintain independence from encroaching Western powers. The establishment of a Thai technocratic bureaucracy with many ministers and officials holding foreign degrees and maintaining strong ties to the military was not simply a product of American modernization, but was well underway since 1900. The terms of U.S. involvement in Thailand after 1950 greatly expanded the

reach of this technocratic elite, but their ultimate successes (and failures) relied on the preexistence of an earlier technocracy already comfortable with close ties between military, engineering, and civilian agencies as well as foreign advisors necessary for bringing projects to completion (Stifel, 1976, p. 1186). Exploration or comparison of such Asian ideologies of modernization is still difficult; archives in Thailand, Vietnam, and China have yet to open much of their records from these domestic engineering agencies. Vietnam offers the rare exception, however; pre-1975 government records from the Diem (1954–1963) and Thieu (1967–1975) administrations have been largely opened by the post-1975 government.

Certainly, massive infusions of American capital, equipment, and military forces after 1950 had widespread effects on the region's environment and society, but the problem so well illustrated at Hole 108 was that recipient governments were far from passive about the ways they embraced or rejected it. Sunil Khilnani's *The Idea of India* (1999) suggests how we might consider such indigenous perspectives on modernization through his account of the ways that Indian leaders blended their own historical traditions with shifting allegiances to Soviet and American nation builders in their bid to define modern Indian society. Similar struggles are underway today in the Mekong region as Vietnam, Cambodia, Laos, and Thailand struggle to redefine their own national and regional pasts with shifting allegiances from Soviet or American patronage to a greater range of multinational players including international lending agencies, states, and private corporations.

Interpreted within these more local perspectives on modernization, the legacy and memory of the bureau in the Mekong Valley is especially interesting as its engineers did not attempt to steer development as did so many American military and civilian advisors, but instead they remained faithful to the bureau interest in advancing its own style of engineering and "breaking trail" for successive privatization of water resources. The training programs it offered at Denver Hydraulics Lab did not demand its students follow particular ideologies, so long as they participated in bureau techniques for designing and managing dams. Rather than export an "idea" of the nation or region, such training programs simply extended what Theodore Porter (1995) called a culture of objectivity. Foreign trainees learned the American engineers' strategy of claiming political immunity by appealing to the public's trust in their work with numbers. They learned to avoid political engagement at the grassroots level by simply focusing on building the dam while others carried out often-violent struggles to determine whether conditions would permit such work to take place. Upon their return home, bureau trainees often took lucrative jobs in government agencies such as EGAT or worked elsewhere in private firms. They quickly became valuable

as bicultural middlemen, negotiating their own nation's modernization interests with knowledge of changing opportunities with U.S. government grants and private corporations. The antipolitical stance of bureau staff and their tendency to rely on private contractors also fostered a boom for American firms, with bureau employees frequently quitting their advisory positions to work as private consultants for local governments spending funds derived from World Bank loans.

This pattern of intentionally opting out of high-profile, state-centered nation building for the safer realm of the private sector has certainly continued today in the Mekong Region. Private spin-off companies continue to carry out surveys and design work that is simply too contentious for regional or national agencies to carry out. Shinawatra's attempted privatization of EGAT itself suggests that the antipolitics strategy encouraged by the bureau's approach to irrigation is perhaps more prevalent now as a strategy of development than ever before. What is ironic, in light of the bureau's historic role in the training and development of staff for state agencies in the region, is that given the lack of transparency or accountability in such modernizing projects today, it is unlikely that today's Bureau of Reclamation or any other U.S. firms could play any substantial role in future construction projects. By furthering the privatization of engineering work from multinational agencies such as the Mekong Committee to a mix of private firms, grassroots nongovernmental organizations, and smaller national agencies, the bureau's legacy in the region may very well be the initiation of efforts to finally build a cascade of giant concrete dams while problems associated with environmental degradation and the uneven distribution of benefits from the dams' operation will continue to go unaddressed.

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