

Making and Unmaking the Mekong Delta: Water Management in Historical and Contemporary Perspective

David Biggs, Fiona Miller and Hoanh Chu Thai

Key words: environmental history; water resources management; resource use conflict; adaptation; Mekong Delta; Vietnam

Abstract

Present day environmental challenges facing policy-makers and individuals in the Mekong Delta are largely manmade problems resulting from past decisions that have relied upon an ideology of control at a grand scale rather than adaptation based on local knowledge and agro-ecological diversity. Past experiences of colonial rule, intense military conflict and threats posed by natural hazards both interrupted and amplified these large-scale approaches to water resource development. Contemporary conflicts over resources are an expression of both intensified demand for the delta's water resources and the lingering influences of past traditions of technocratic management. The continued presence of natural hazards such as floods and drought is likely to be augmented by new environmental risks such as rising sea levels and upstream factors such as dams in the Mekong River Basin. The authors address three features in this modern history of water resource development which have bearing upon future development strategies: the inflexibilities associated with locking into a control-oriented approach to water; the

tendency of grand plans to conceal diversity and centralize decision making power; and the continuing problems of resource competition and environmental risks. In light of our examination of key historical events and processes, and in consideration of significant contemporary and future social and environmental challenges, the authors argue there is a need and an opportunity to reorient development thinking and the underlying resource ideology to one that recognizes diversity and dynamism in both the social and environmental elements of water resource development in the Mekong Delta. One means of accomplishing this goal is to assess past resource development strategies in a more critical historical perspective that pays closer attention to alternative approaches and local traditions for managing water resources used in the past that reduced social vulnerability, supported diverse livelihoods and resource management strategies, and strengthened local institutional linkages.

Introduction

The unique water landscape of the Mekong Delta, with its dense maze of canals, extensive horizons of rice fields, village orchards and aquaculture farms, is very clearly the result of combined social and natural forces. The natural forces of rain, floods and tides, the spatial distributions of alluvial, acid sulphate and saline soils, the variations in fresh and saltwater, constantly shape the contours of this highly dynamic landscape, while the construction of canals, dikes and human settlements have produced contrasting lines that dissect this landscape of sinuous creeks and parcelled fields. The *made* landscape defined by this ongoing canal building enterprise and other works associated with a rapidly urbanizing human landscape remains at constant risk of being *unmade* by the sediment spreading effects of seasonal floods, erosion from daily tidal fluxes, storms, and other forces. Enormous investments are required to keep the waterways free of sediment for irrigation, flood control and transportation. Yet this same sediment, and the associated nutrients contained in it, is crucially important to both agricultural productivity and ecological biodiversity.

Many of the present day challenges facing society in the delta are thus the result of a history of past actions that have tended towards a more mechanistic approach to the environment premised on ideologies of centralized control rather than adaptation to change and variability. The clearly delineated physical geography of the delta bounded by coastlines and waterways has inspired grand plans of ambitious engineering. The predictability of the natural and social environment, assumed by such master planning,

has been contradicted by periods of intense military conflict and the continuing occurrence of catastrophic floods and sudden shifts in freshwater availability. The threats posed by these hazards have both interrupted and justified certain water resource development programs. Contemporary conflicts over resources are an expression of both more intensive demands for water resources and a continuing dependency on a style of technological thinking that underpins this intensification.

This paper traces the historical tensions between adaptive and control-oriented approaches to water in the delta region, considering causes behind the historical shift from traditional approaches oriented to flexible adaptation towards modernist policies of centralized governmental control in the 19th and 20th centuries. More recently, interest in more adaptive and decentralized approaches to water management has returned although large-scale, ‘command and control’ approaches continue to dominate; yet, modern era institutional, political and technological legacies prevent the easy adoption of new policy alternatives. To what extent are future development choices constrained by the weight of this history of past choices that supported the state’s technological domination over water environments? In an era where uncertainty and risk is of growing concern to policymakers and inhabitants, a critical historical perspective on water resources management may reveal more clearly how past decisions have closed off present-day opportunities to pursue new approaches or more ideally identify where opportunities for alternatives to contested policies might still exist.

In light of our examination of historical events and processes informing contemporary social and environmental problems, the authors argue that there is both a need and an opportunity to reorient development thinking and the underlying resource ideology from one that tends to only look forward into the future to one that considers actions in the past and recognizes diversity and dynamism in social and environmental elements of the delta landscape. This past-minded approach may then help assess alternative approaches to contemporary threats, including environmental hazards and the potential for social tension.

Using stories that illustrate the connections between contemporary problems and past decisions in water control, this paper focuses on three interconnected social and environmental issues that have defined environmental issues in the delta: mechanical approaches to water management, total management schemes, and trends in disaster response. After giving a brief overview of past and contemporary issues of the water landscape in the delta, this paper considers how an ideology of modern, technocratic control came to dominate decision-making processes. This ideology has changed over the decades from its often violent implementation in the colonial era to more international approaches favored by state engineers under the advice of foreign consultants with experience in other river basins and deltas. In the post-colonial era, policymakers experimented more with delta-wide management plans that might be achieved with more elaborate technology and foreign aid. This experience was largely a result of intense American involvement and financial support in Vietnam from 1950, but it also echoed similar basin management schemes then initiated in India, China, and other countries at

the same time. Given the role that war and natural catastrophe played in limiting water resource development in these decades, the third section considers how such social and natural disasters not only disrupted attempts for centralized water management but also presented some interesting alternatives in methods of disaster response. The paper concludes by returning to its main premise that a historically informed analysis of present-day challenges may be employed not only to critique the assumptions of large-scale water management schemes but also to suggest more effective alternatives. By focusing on three major issues as articulated by key events, we will examine the evolution of a unique water landscape that has resulted in the creation of one of the most intensively populated and cultivated regions in the world

A Brief Overview of Water Management in the Mekong Delta

The Mekong Delta covers an area roughly 5.9 million hectares in area and spans the southernmost border between present-day Vietnam and Cambodia with roughly 4 million hectares in Vietnam. Although the region's population today exceeds eighteen million, for most of the delta's history it was relatively sparsely inhabited. Archeological excavations undertaken with the aid of aerial photography in the 1930's revealed canals and settlements near present-day towns such as Long Xuyen and Dong Thap that were built sometime between 300 BCE and 700 CE.¹ Material traces from this era include

¹ One of the most comprehensive descriptions of the ancient material culture in the delta is Louis Malleret, *L'Archéologie du Delta du Mékong*. Paris: École Française d'Extrême-Orient (1959). See Volume 1, pp. 27-33, for an excellent discussion of ancient hydraulic infrastructure and pre-Angkor settlements near present-day Châu Đốc and the Vĩnh Tế Canal. George Coedès also translated stone inscriptions and Chinese documents to suggest that this was the first "Indianized Kingdom" in Southeast Asia and that elite members of the Court traveled around the Gulf of Thailand and to India and China. See George Coedès, *The Indianized States of Southeast Asia*, pp. 35-80.

wooden piers, gold jewelry, Buddhist and Hindu statues, brick foundations and large canals that connected the sites to coastal ports some ninety kilometers away.² This early kingdom was oriented to commerce and there is little evidence to suggest that the canals served irrigation needs at the time. The fact that this society disappeared rather suddenly after 700 CE suggests the precarious nature of this building process where early society in the delta was vulnerable to piracy, silted waterways and bays, diseases and competition from other trading ports in the region.

Modern water management in the Mekong Delta accompanied the expansion of Vietnamese and ethnic-Chinese interests in the region beginning in the 1700's. Increases in population coupled with political changes in the SE Asian nations and China brought waves of settlers and trading interests to what some historians now describe as a "water frontier" in the Mekong Basin where Thai, Khmer, Viet, Chinese, Malay and European interests intermixed.³ With such historic projects as the Vinh Te Canal built from 1820 to 1825, the Vietnamese kingdom initiated several canal projects intended to facilitate *navigation* and settlement in a contested frontier zone between Vietnam and Cambodia. Amidst widespread Khmer resistance and several local uprisings, Vietnamese military authorities completed several major waterways that helped them achieve strategic control and stimulated further development of the region for agriculture.⁴ After several decades of continuing unrest into the 1840's, the French navy then commenced a campaign to conquer the delta in 1858 and achieved political control over the delta in 1867.

² Pierre Paris, "Anciens Canaux Reconnus Sur Photographs Aériennes dans les Provinces de Tak Ev et de Châu Đốc," *Bulletin de l'École Française de l'Extrême-Orient* XXXI (1931), 221-223.

³ Nola Cooke and Li Tana, Eds. *Water Frontier: Commerce and the Chinese in the Lower Mekong Region, 1750-1880* (New York: Rowman and Littlefield, 2004).

⁴ Nguyễn Văn Hầu, *Thoại Ngôc Hầu*, 183.

With the introduction of steam dredging in the 1880's and continuing waves of Vietnamese settlers coming from more crowded provinces, the region's population climbed from some five hundred thousand in 1860 to over four million in 1930. In this period of colonial projects lasting until the Great Depression in 1930, more than 165 million cubic meters of earth were dredged and the total area put under cultivation rose fourfold to roughly two million hectares.⁵ From 1930, combined economic, political and environmental troubles effectively stalled further reclamation projects to the end of French rule in 1945. The end of World War II was followed by three decades of fighting where there were few new canal projects achieved. Nevertheless, this war period was important for incubating new strategies of water use that involved reverting to traditional methods especially in resistance zones controlled by Vietnamese revolutionaries and adopting new technologies such as portable pump motors across the region.

Following the end of the Second Indochina War in 1975, the re-unified Vietnamese government immediately embarked on a number of major new reclamation projects as well as repairing war-damaged infrastructure. However, it was not until the relaxation of collectivization strategies and the privatization of agriculture in 1986 that production levels and intensification of agriculture began to take hold. Since then, the Mekong Delta has become one of the most productive zones for rice and aquaculture in the world, supplying more than half of Vietnam's foreign trade in these staples.

⁵ Inspection des Travaux Publics, Gouvernement Générale de l'Indochine, *Dragages de Cochinchine: Canal Rachgia-Hatien* (Saigon: [s.n.], 1930), 20.

Since the 1986 reforms, the Vietnamese government's response to water management issues in the delta has been complicated by several factors. Firstly, the national government has moved to shift the cost of maintaining canals and other infrastructure to provincial and local governments. In October 2007, the Vietnamese Government issued a new policy of exempting irrigation fees at the national level, effective January 1, 2008, in exchange for reduced technical and logistical support for operation and maintenance (O&M). This political decision has presented a challenge to local authorities including farmer groups who are managing irrigation systems to find a new cooperation model that can sustain and improve O&M of their systems. Secondly, control over the development of waterways and irrigation has shifted from the single domain of the Ministry of Agriculture and Rural Development (MARD) to shared responsibility between MARD and the Ministry of Natural Resources and the Environment (MONRE) and a new River Basin Organization (RBO) structure. Conflicts over jurisdiction and funding thus continue to undermine coordinated solutions to such problems as rising water prices, loss of ecological diversity, continued insistence on provincial jurisdictions that neglect natural boundaries.

While it is obvious that contemporary policy-makers and individuals are facing very different economic and ecological conditions in the region than those in past eras, the following three sections consider how specific features of this past—mechanistic approaches to the water environment, state-centered regional management plans, and state versus individual responses to disasters—continue to play into contemporary policy debates. Before examining each of these in more detail, it should also be recognized that

these episodes in the delta's environmental past have close parallels with broader events in the modern history of water reclamation in other parts of the world. From the Florida Everglades to the Rhone or Bengal Deltas, mechanical dredging dramatically extended the jurisdiction of the state's public works authority into areas formerly managed locally. Environmental disasters such as floods and rising resistance to state authorities during and after the Great Depression of 1930 triggered widespread re-examinations of such public works programs in the decades since. The level of violence reached in the Mekong Delta from 1945 to 1975 may be somewhat unique in the twentieth century, however outbreaks of violence between settlers and state authorities were not uncommon in other river deltas and on agricultural frontiers. Many of the phenomena described below in the *making* of the Mekong Delta have parallels in other river deltas; however, since resource politics are almost always eventually local problems, this essay considers how broader trends in water management combined with specific environmental and social features to produce local paradigms in water management that continue to influence policy in the region.

The Delta as a Hydro-Agricultural Machine

From very early in the colonial period, hydrographers and engineers noted the physical and ecological complexity of the water environment in the Mekong Delta. The extreme flatness of the delta combined with high sediment content in the rivers produced hogsback ridges (*lưng tôm, dos d'âne*) in newly constructed canals that soon interrupted most water traffic when the tide was low. French observers generally saw such areas as

dead zones because here the water stilled and most deeper-hulled boats were forced to wait for the high tide to pass.⁶ local people, however, considered such places as “meeting points” (*giáp nước*) and frequently built markets at the intersections of opposing currents. The village of Thủ Thừa, located on a cut between the two branches of the Vàm Cỏ River was one such place where people traveling from different places with different goods to trade met.⁷ This tidal ebb and flow of water in the delta was also an important source of clean water and fertilizer. Water in the fields slowly leached hydrogen sulfate (H_2SO_4) from aerated soil. If allowed to sit for too long, the acidic water dissolved aluminum and iron ions and stunted plants. To prevent this buildup of “alum,” farmers frequently drained water from the paddy by opening their dikes and letting water escape while the tide was out. When the tide rose again, fresh water from the river filled the ditches and returned clean water to the paddy. For this reason, the most highly prized farmland in the delta was the alluvial region crossed by hundreds of sinuous creeks. Nature provided a system of irrigation that required almost no extra labor. Thus, the delta’s inhabitants and the colony’s metropolitan engineers held fundamentally different ideas about the way that nature and water should work in the delta. Engineers, standing in one of the flattest deltas in the world, were effectively blind to the rural functions of the terrain and confused by a hydrology that was by all standards exotic.

While engineers and development specialists have become much more sophisticated in their understanding of hydrology, this main difference in viewpoints towards the natural

⁶ Direction Générale des Travaux Publics, Gouvernement Générale de l’Indochine. *Voies d’Eau de la Cochinchine*. Saigon: Imprimerie Nouvelle, 1911, 34.

⁷ Nguyễn Hiền Lê, *Bảy Ngày Trong Đồng Tháp: Du Ký và Biên Khảo* (Long An: NXB Long An, 1989), 23-28.

flow of water in the delta has continued ever since. The increased investment in large-scale fixes to hydrological “problems” in the delta has resulted in the construction of coastal and flood protection dikes and dams premised on greater “water security” in the face of climate change threats. At a conference on 24 March 2008 MARD revealed new plans to raise around VND10.7 trillion (US\$676 million) to further extend and upgrade dikes in fifteen vulnerable provinces along the VN coast, including seven in the Mekong Delta. These new developments, direct extensions of plans for sea dikes first formulated in the 1950s, represent the latest step in furthering human control over the natural flow of water between the delta and the sea.

Why have local and state governments over the years continued to favor such mechanical approaches to water management over projects that work off of the natural ebb and flow of the rivers and tides? While the Mekong Delta is not unique in the world with respect to states managing the construction of massive dams, dikes or levees, there are two factors in the delta’s colonial past that require attention if one is to understand the historic role that machines and contractors have played in state decisions to build large structures. The introduction of steam-powered dredging machines to the Mekong Delta in the late 1880’s fit the political and technical needs of the colonial state by replacing the thousands of laborers needed in previous projects and, through the enterprise that operated them, returning most of the money spent on this work to French interests rather than Vietnamese labor crews. This colonial preference in the manner of funding projects continued into the 1960’s as the United States Agency for International Development typically supported big-ticket purchases of American-made equipment such as a fleet of

new diesel-powered dredges to be operated by American construction firms as well as the newly established Vietnamese Ministry of Public Works. In the late 1950's, the US Operations Mission in Saigon even hired the old French dredging enterprise to operate the dredges and train Vietnamese crews. Amidst frequent skepticism both in Vietnam and in Washington that such aid was merely enriching American and French interests at the expense of the waterway system, the U.S. advisory mission in Saigon continued to call for more equipment as the war intensified.⁸ After 1960, American construction firms such as DMJM (now AECOM) and KBR (now part of Halliburton) entered Vietnam to fulfill much larger contracts to build highways, dredge canals and after 1965 to build military bases. Because these firms typically worked with heavy, diesel-powered equipment, they tended to propose projects that made use of these machines.

Concerns about the greater influence of politically connected contractors over that of local water users have resurfaced in the present era of economic growth, though competition between companies and an increasing number of local firms suggests that the politics of construction have changed considerably. The following story about dredging politics in Luong Hoa Commune, Tra Vinh, however, illustrates that this conflict between outside construction firms and local water users continues. The recent phase-out of “public service labor” (*lao dong cong ich*) in favour of charging water users a fee and replacing manual dredging with the hire of a firm operating mechanical dredgers has generally resulted in the degradation of secondary and tertiary irrigation channels. Many of the district's poorer farmers can not pay the fee and instead they prefer to contribute labour; however, there is concern about the quality of canals dug partly by hand and

⁸ Raymond T. Moyer to Leland Barrows, 13 July 1956, NARAII, RG469.E1456.Box 15.

partly by machine as the machine-dug portions are deeper; because farmers are annoyed that the government did not fully maintain the secondary canals, they have thus neglected maintaining tertiary canals that have in turn limited water access to the poorest farmers who tend to live far from these ditches or on higher land. As a final complicating twist, this story has recently been resolved by a large cash injection into the mechanical dredging program by a Japanese aid project. This does not, however, solve the problem of finding an enduring solution to the maintenance of irrigation infrastructure to ensure fair and efficient water access for small rice farmers reliant on timely water availability.⁹

Looking at the flows of funding—especially the unusual infusion of cash from Japan in this case—and the actors involved, one issue not yet resolved is what safeguards exist to ensure that contractors respond not just to the needs of states but also to those of water users. Again, looking to the past, historic records reveal that even one hundred years ago, determining state and contractor liability to water users was a complicated subject for courts and administrative bodies. During construction of one the first major colonial projects, Xa No Canal, a group of native landowners in 1901 brought a suit against the government seeking indemnities for damages to land after a dredger cut the village off from the existing waterways. The matter, pitting a group of relatively wealthy Vietnamese landowners against the colonial Department of Public Works, eventually reached the desk of the Governor General in Hanoi in 1901 who decided the value gained in having property bordering the new canal outweighed the damages done through the destruction of existing irrigation structures.¹⁰ Since that time, especially with Vietnamese

⁹ Fiona Miller, forthcoming.

¹⁰ Nguyễn Ngọc Chấn to Chief of Định Bảo District, 12 June 1901, TTLTQG2, Fonds Goucoch IA 13/232(1).

independence and reunification, government accountability and response to local complaints has improved considerably; however, administrative mechanisms for resolving local grievances continue to lag behind local expectations.

Finally, one other reason why both resource managers and water users may be inclined to seek “big fixes” to their problems is because once a new construction is initiated it tends to require successive constructions to maintain it. A French inspector studying the colony’s early plan to build new infrastructure in 1881 called such projects “ouevres de Penelope” (works without end). Visiting the colony on a fact-finding mission in 1880-81, Charles Combier assessed the colony’s proposal to build canals and elevated railways throughout the delta and criticized the plans on numerous grounds, first on the ethical basis that funding for the projects was to come partly from state-controlled sales of opium and then on technical grounds as engineers had not yet solved the problem of hogsback ridges and thus dredges would be constantly returning to clean silt out of the new canals.¹¹ More canals would thus create greater dependency on mechanical dredging and state funds to maintain irrigation. When economic and political events after 1930 prevented the dredges from keeping up with their routine schedule of clearing channels, large portions of the irrigation infrastructure became degraded and many people abandoned these areas. Considering the story in Tra Vinh described above, replacing public service labor with mechanical dredging will likely require mechanical dredging in the future to maintain deeper channels; thus by shifting the burden of maintaining waterways to construction firms, the state is increasing its dependence on such firms in

¹¹ Ch. Combier, *Rapports présentés à S.E. Ministre de la Marine et des Colonies sur les Grands Travaux Projetés en Cochinchine* (1881), 4°/904(3), Social Sciences Information Center, Hà Nội.

the future, making it vulnerable to the availability of heavy equipment, spare parts, and fuel prices.

Total Management Schemes

Another key issue that has played a major role in the development of water use policy in the delta is a long history of delta-wide and basin-wide total water management plans. While increasing communication between the riparian states in such organizations as the Mekong River Commission is generally viewed as a positive step towards encouraging international cooperation towards sustainable water use, the ways in which delta master plans and basin management schemes have been established in the past has produced trends towards technocratic management and solutions that favor major modifications to the river's hydrology that remain problematic in the present. The Mekong Committee, formed in 1957, initially focused on building a cascade of mainstream dams on the Mekong river below the Chinese border. The conceptual division of the basin into upper/Chinese and lower/SE Asian regions in the 1950's especially reflected American concerns in containing Chinese economic and political influence by focusing development initiatives solely on the lower half of the Mekong basin located outside Chinese territory. The United States' changing relationship with China after 1949 played a major role in the type of support given to Mekong projects and the Mekong Committee. Before the Communist Chinese military victory over the Nationalists in 1949, American and Chinese engineers had worked extensively together on projects such as a proposed

dam at Three Gorges on the Yangtze.¹² Only after the establishment of the PRC did American agencies pay closer attention to While no dams have been built in this proposed cascade in the lower valley, this period of intense international involvement in the development of water resources in the Mekong was quite influential as the surveys and feasibility studies produced then continue to attract the interest of individual states and private firms lured by the promise of electricity generation and water control.

One major implication of China's economic boom and increased concern over climate change in the region has been a renewed emphasis on infrastructural solutions that aim to "climate proof" local economies by ensuring the security of water and energy supply. This has seen renewed attention given to upstream dams, as documented in the World Bank Mekong Water Resources Assistance Strategy (2006). Mainstream dams in the lower basin are now back on the planning board, after a period when increased awareness of the environmental and social implications of such dams had limited international multilateral investment. China is steadily and determinedly pursuing the construction of twelve dams on the upper length of the Mekong. With estimates that as much as eighty percent of the Mekong River's sediment originates in the upper basin (insert reference), the impending decline in sediment loads in the lower basin is likely to have severe implications for stream and floodplain morphology throughout the basin, notably in the delta where the river deposits much of its sediments. Farmers are highly dependent on the sediment and nutrients brought by the seasonal floodwaters to maintaining soil fertility and thus crop productivity.

¹² David Biggs. "Reclamation Nations: The U.S. Bureau of Reclamation's Role in Water Management and Nation Building in the Mekong Valley, 1945–1975," *Comparative Technology Transfer and Society*, Vol. 4, No. 3 (2006), 225-246.

Historically Vietnam had been an advocate of Mekong mainstream dams, seeing the potential flood control and dry season flow augmentation function of dams as beneficial to agricultural production in the delta. The many environmental impacts such changes in water control would pose for the delta's agro-ecosystems have been of less concern. Vietnam, Cambodia and Laos are also now increasing their investment in tributary dams in the Mekong Basin, while Thailand, Laos and Cambodia are considering construction of dams across the mainstream. Vietnam has already constructed one large dam on the Sesan River in the upper Vietnamese Mekong Basin and Electricity Viet Nam plans to build a further number of dams on the Sesan and Sre Pok tributaries. The spectre of climate change is likely to put ecological and political systems under increased stress, and as with previous threats such as natural hazards, infrastructural solutions again seem to be coming to the fore. The predicted impacts on the delta include a rise in sea level and the increase in the incidence of storm surges.¹³

In the Mekong Delta, the most common form of regional planning that has had significant impacts on water resource use is the long-term "Dutch dike" strategy that involves building extensive sea dikes to extend the range of lands irrigated with freshwater. The first projects to build dikes and saltwater dams in the delta began in the colonial era in the 1930's as hydraulic engineers and agricultural development cadres sought to clear new lands to raise the colony's production of rice and also defuse mounting social tensions by resettling many thousands of poor tenants to the new lands.

¹³ HCT: Refer to paper on the impact of sea level rise on hydrology and rice in the Mekong Delta when I was at IRRI.

French colonial officials, influenced largely by the dike-enclosed landscapes encountered in the Red River Delta, drew up massive plans to relocate farmers from the Red River Delta into the broad depression of the Long Xuyen Quadrangle as well as brackish-water lands along the eastern coast. In 1943 during the Japanese military occupation, the Vichy Governor General Decoux created a new budget category titled “Aid to Rice Farmers” that called for five million piasters to send entire villages of peasants down the recently completed Trans-Indochinoise Railway to populate these settlements.¹⁴ After the 1954 Geneva Accords brought an end to the First Indochina War, the Republic of Vietnam with unprecedented levels of American technical and financial support continued this settlement and “Dutch dike” strategy especially in politically contested areas such as Long Xuyen and Dong Thap (Plain of Reeds). Philip Catton describes one anecdote by Edward Lansdale who recalled that almost every time he visited the President in his office, Diệm was “deep in the study of some new program, often of vast dimensions.” The Vietnamese leader was known to be personally interested in such settlement schemes, and his desk was often covered in maps. Since his days as a province chief in the 1920's, Diệm encouraged peasant settlement on empty lands and supported calls for reforms in the 1930's.¹⁵

While the Saigon government continued to advocate more coercive settlement programs in newly reclaimed areas such as agrovilles and strategic hamlets in the 1960's, Vietnamese and many foreign advisory teams continued developing regional management schemes and conducting feasibility studies to the war's end in 1975. As

¹⁴ 30 Sept 1942. Decoux to the Governor of Cochinchina. File H62/10, TDBCPCNV Record Group, VNA2.

¹⁵ Philip E. Catton. *Diem's Final Failure*, 51.

part of President Lyndon B. Johnson's initiative to "win hearts and minds," David Lilienthal, known in the 1960's as the architect of the Tennessee Valley Authority and in the press as "Mr. TVA," accepted a contract in 1966 to organize with Vietnamese officials a Mekong Delta Development Program. As a "true believer" in the promise of high technology and modernization to empower grassroots participation, Lilienthal quickly grew skeptical upon seeing the apparent disconnects between the American "pacification" mission, the violence of the counterinsurgency experiments, and the military conduct of the war. Upon seeing Vietnamese farmers passing his boat traveling on canoes with a modified "long-tailed" outboard engine, he reflects in his journals that "even on many technical matters it is *we* who have a lot to learn."¹⁶

During this era of "post-hostility" planning, with local governments and popular participation in resource policies suppressed by military concerns especially after the battles of the 1968 Tet Offensive, a host of private consulting firms and international research teams published many reports for large-scale settlement initiatives. Two American moves, the creation of the Asian Development Bank (ADB) and President Nixon's policy of "Asian regionalism," contracting with regional companies instead of Americans to carry out development projects in Vietnam, had a lasting effect on the international nature of water and land use planning in the Mekong Delta. One Asian firm in particular, Nippon Koei, exemplified the return of Japanese technicians and investors to the region after the Japanese evacuation from the region in 1945. Formed in 1946 during the American occupation of Tokyo, Nippon Koei took some of the more

¹⁶ David E. Lilienthal. *The Journals of David E. Lilienthal: Volume VI: Creativity and Conflict 1964-1967* (New York: Harper & Row, 1976), 373.-

dangerous projects in the Mekong Delta that typically required field surveys and the placement of construction teams in non-secure areas. Beginning with surveys conducted in 1957, the company sent its engineers to a series of salt intrusion barriers abandoned by the French in 1946. Intermittently into the 1970's, Nippon Koei then fulfilled contracts to re-develop the works, and in 1972 actually completed construction of one anti-salinity dam at Tiệp Nhứt southeast of Sóc Trang. Funded by the World Bank, the project aimed to protect some fifty thousand hectares of farmland from salt intrusion in the dry season. Nippon Koei's engineers continued visits to the site as late as 1974, when they noticed almost immediately that the new project had stopped saltwater from intruding but had created other problems due to stagnating water inside the dikes. Were it not for farmers inside the area using an estimated one thousand portable water pumps to individually move the water, the dikes would have been of little use in improving agricultural productivity.¹⁷

Not only were such “Dutch dike” schemes employed by the colonial and Saigon governments, but after 1975, the reunified Vietnamese government commenced a “rice everywhere” campaign due to the shortage of food in the country, especially in the North. Hence saline water continued to be seen as a constraint to agriculture that requires fresh water, not as a resource. (HCT reference) While such schemes to manage water across vast territories were never realized during the decades of unrest, they continue to be compromised by local acts in the present. In February 2001, farmers in Bac Lieu province broke the Lang Tram dam for salinity protection to bring salt water into a

¹⁷ Nippon Koei Company, Ltd, “Design Report on Ngân Rô Barrage Project,” October 1966, TTLTQG2, NL402.

protected area that was planned for rice production to raise shrimp instead. (HCT - Water Policy Journal in 2003) The state was not sufficiently flexible to respond to changing market demands and local desires, thus illustrating the main conflict between adapting to natural resources versus resisting and controlling natural forces to achieve ends conceived by state officials.

Such attempts to 'hold back the tide' through grand plans for the intensification of freshwater use for rice thus obscure local agro-ecological diversity and marginalize local interests. Changing the "Dutch dike" strategy was simply not possible when rice production was not enough for food security in the country. During the first few years of market-oriented policy after 1986, rice farmers in the Mekong Delta were at first happy with surplus rice production that improved their livelihoods compared with farmers elsewhere. However, since the mid-1990's, the limited income of rice farmers has not helped them keep up with the high speed of economic growth; hence they have become one of the poorest groups in their communities. With the reform policy that stopped the use of quotas in rice production and allowed diversification, farmers have switched to more high income crops such as fruit trees or aquaculture.

Since the late colonial era, a very large investment of capital, much of it raised through development bank loans, has been deployed towards the construction of sea dikes and other infrastructure intended primarily to maintain the region as a freshwater, rice-producing environment. Despite Vietnam's isolation from many foreign markets after 1975, the national government continued this trend of investment in infrastructure.

However, the state's tendency towards a more market-oriented approach in terms of crop selection has found no parallel with regard to infrastructure. Rather than allow local communities and provinces to choose more flexible approaches that allow greater participation, the current government in Vietnam instead faces the increasingly difficult challenge to continue another cycle of investment into new infrastructure at the same time that it attempts to maintain older works.

Responses to Conflict and Catastrophe

Finally, past responses to both natural disasters such as floods and destructive conflicts such as the Indochina Wars have had far-reaching effects on patterns of water management in the Mekong Delta. While the region has been at peace since 1975, popular attachments to marginally productive, flood-prone areas such as U Minh Forest and the Plain of Reeds (Dong Thap Muoi) as “cradles of the revolution” have led to a spate of post-war projects to drain these wetlands and settle tens of thousands of new migrants into these areas despite their susceptibility to flooding and marginal productivity. Recent proponents for conserving these quickly vanishing natural areas have recently come into conflict with older proponents of new settlement and reclamation. In the spring dry season of 2002, over 8,000 hectares of one of the last major remnants of cajuput forest and peat swamp at U Minh burned out of control. In the aftermath of these fires, national newspapers posted many stories laying the blame for the fires on poor migrant settlers in some cases and on surrounding enterprises lowering the

general water table in the surrounding area.¹⁸ This one event was particularly troubling because U Minh's forests had for decades served as an important base area for revolutionaries that were now leaders at all levels of government. As guerillas, they resisted repeated efforts by French, American and South Vietnamese military forces to drain and penetrate the swampy terrain using armored dredges, napalm, Agent Orange, and B52 bombing strikes; as civilians in the post-war era, however, they could not control the actions of park managers or thousands of settlers hungry for land.¹⁹ This emerging conflict points to the intense pressures of economic growth on the whole country, where people have to find every way possible to increase their immediate income to survive lest they become the "poor" in society. The still weak institutional structure for managing protected zones and water use can not yet fully detect or punish those who misuse protected resources or public property.

This final section considers how past conflicts and state responses to disasters have produced historic disconnections between individuals and the state that continue to undermine the state's ability to enforce new policies, especially in the current era of market liberalization. Individual attitudes towards state-initiated conservation measures are mediated by a deep history of negative experiences with state authorities that did little to support farmers' needs and instead encouraged settlers to clear forests and drain swamps. French historian Pierre Bruchaux describes how colonial land policies and the all-consuming demand for wood to supply the need for steam engines produced what he terms a colonial frontier society in the delta. Individuals followed in the wake of the

¹⁸ B. M. Sanders. "Fire Incident Assessment, U Minh Ha and U Minh Thuong National Park, Ca Mau and Kien Giang Provinces, Vietnam" (Hanoi: J.G. Goldammer/Global Fire Monitoring Center, 2002), 113.

¹⁹ For more on U Minh please see David Biggs. "Managing a Rebel Landscape: Conservation, Pioneers and the Revolutionary Past in the U Minh Forest, Vietnam" *Environmental History* (July 2005), 448-476.

steam dredges, unloading their sampans (*ghe tam bản*) with tools, supplies, and basic building materials. They built huts, burned down sections of the forest beyond, and began the back-breaking work of clearing stumps and forming fields. Once land was cleared and agriculturally productive, however, they often found that landlords had already claimed rights to the land. They then either left to clear new, unclaimed lands or else worked out some tenancy arrangement.²⁰ As early as 1905, the Friends of the Forest Service noted that years of unregulated cutting and fires caused largely from burning intended to open up land for paddy threatened to destroy what little remained of the delta's forests.²¹ Rather than restrict cutting, however, the colonial Forest Service responded to these concerns by removing the one forestry representative out of the delta as they saw little need to conserve the twisted, waterlogged trunks of the "charcoal forests."²² As economic conditions worsened with the Great Depression after 1930, many thousands of tenants living in marginally productive, flood-prone areas such as U Minh joined the campaigns of the Indochinese Communist Party, forming protests that called for lower interest rates, food for the starving, and land to the tiller. Few people would have voluntarily maintained canals, dikes or other irrigation structures given that land before 1945 was heavily concentrated in the hands of a very tiny percentage of landholders.

What is ironic after the outbreak of the August Revolution in 1945 and the start of the First Indochina War is that the same individuals in their support for the Vietnamese Revolution often performed heroic measures to maintain the forested wetlands and

²⁰ Pierre Brocheux. *The Mekong Delta: Ecology, Economy and Revolution, 1860-1960* (Madison WI: Center for Southeast Asian Studies, 1985), 123.

²¹ "Le Service Forestier en Indochine," *Bulletin de l'Association Amicale des Agents Forestiers No. 11* (1909), Vietnam National Archives No. 2 (TTLTQG2), Fonds Goucoch, IA 13/308(12).

²² Frédéric Thomas. *Histoire du Regime et des Services Forestiers Français en Indochine de 1862 à 1945* (Hà Nội: Thế Giới, 1999), 73.

perimeter areas. As guerillas, they built submerged barriers in the canals and creeks and waited at key bottlenecks to ambush French vessels. French forces in turn used flamethrowers and incendiary bombs to burn away the forest and French aircraft repeatedly bombed the earthen dams that the Việt Minh militias built in efforts to drain swampy terrain. In his history of one U Minh base, Bui Văn Thành recognizes the role that such barriers played in protecting the base; the larger dams required hundreds of laborers working in often-dangerous conditions to repair them. These dams were soon referred to by name.²³

These environmental and political conditions largely persisted until the end of the Second Indochina War in 1975 with state authorities and military commanders only occasionally recognizing the importance of conservation to rather short-term strategic objectives. During the relatively peaceful interlude between the two wars from 1954 to 1960, the South Vietnamese state together with foreign advisors for the first time considered the importance of conserving wetlands to maintain freshwater reserves for newly implanted refugee settlements. As Vietnamese revolutionaries re-organized their political ranks and prepared for a new military campaign in 1959-60, state officials increasingly sought to close off troublesome forested areas such as U Minh from any human traffic as a strategic means of containing the spread of revolutionary troops.²⁴

²³ Bui Văn Thành, “Báo Cáo Khái Quát Lịch Sử và Phương Hướng Bảo Tồn, Phát Huy Di Tích Lịch Sử Căn Cứ Địa Cách Mạng U Minh Thượng Kiên Giang,” *Kỷ Yếu Hội Thảo Khoa Học: Di Tích Lịch Sử Căn Cứ Địa Cách Mạng U Minh Thượng Kiên Giang* (Rạch Giá: Sở Văn Hoá Thông Tin Thờ Thảo, 1997), 54-55.

²⁴ “L’Administrateur de Rach Gia a Monsieur le Gouverneur de la Cochinchine au sujet de la petit colonisation dans le Canton de Kien Hao,” 1932, TTLTQG2, Fonds Goucoch IB23/096 (12), 3.

Throughout most of the Second Indochina War, these flood plains and wetlands remained solidly under the control of the National Liberation Front. Farmers living in these “free fire zones” were routinely subjected to aerial bombardment and strafing, but they managed to develop a kind of extreme survivor mentality that required almost constant adaptation to changing environmental and social conditions. After several years of more intense American and Vietnamese military campaigns to penetrate the base areas, one American survey estimated that roughly 63,000 people had fled their homes in the base areas to request government assistance and relocation. Traveling in the Cà Mau Peninsula, he described the waterways as “wall to wall boats” where families had brought on their sampans stores of food, house frames and all personal belongings to re-establish homesteads elsewhere. Perhaps most interesting in the report was the general observation that the overwhelming majority of the persons reported that until 1969 living conditions under NLF control were reasonably good. It was only the intensified combat and bombing that forced most of them to move.²⁵

Almost three decades of warfare in the Mekong Delta thus extended the largely unregulated colonial frontier to violent new levels where farmers were forced to survive within the violent exchanges of government and revolutionary forces. Perhaps one of the most important technological changes to occur in this period that has had longstanding effects on water management since 1975 was the rapid proliferation of portable, diesel-powered water pumps introduced after 1960. Robert L. Sansom in *The Economics of*

Insurgency describes how Phạm Văn Thành, a former employee of the French dredging

²⁵ Pacification Studies Group. “The People of the U-Minh Forest Region: A Survey of Their Attitudes in the Context of Past and Present VC/GVN Activities,” RG 472 “Office of Civil Operations for Rural Development Support/Plans, Policy and Programs Directorate/CORDS Historical Working Group Files,” Box 32, NARAII.

company in Sài Gòn, accompanied an ARVN military engineer to watch a dredging project in progress nearby. Studying the old German and Japanese diesel engines powering the French dredges and the centrifugal pumps powering the newer, American equipment, Thành began experimenting with German-made impellers (reversed propellers to create suction, not propulsion) attached to the shaft of American-built engines sold as boat motors. After developing a successful water pump, he sold on average six hundred motors a month through Sansom's period of research in 1967. Sansom's interviews with farmers suggested a rapid, farmer-motivated diffusion of the labor-saving devices often even against the wishes of American, RVN and NLF authorities.²⁶

In light of recent disasters such as the U Minh fires in 2002, what these historical events suggest is first and foremost the intense desire of farmers to adapt to adverse environmental conditions independent from local and state authorities. The reasons for this common resistance to state-initiated projects such as sea dikes in the present are complex, but in many cases they appear to be informed by deep distrust between farmers and state authorities over projects intended to “improve” the land. As demonstrated in the past with the development of water pumps and in the heroic efforts to survive both natural and war-related catastrophes, the farmers living in the delta region are incredibly resourceful and capable of responding quickly to adversity. What appears to be lacking most in the present are the means for farmers and others directly involved in managing the delta’s water resources to have much of a voice in contemporary decision-making

²⁶ Robert L. Sansom. *The Economics of Insurgency in the Mekong Delta of Vietnam* (Cambridge MA: MIT Press, 1970), 167-8.

processes. So long as large projects such as sea dikes or enclosed irrigation districts are conceived without this participation, it is likely that farmers will continue to act independently to realize higher levels of productivity regardless of the environmental consequences.

Conclusions

Returning to this essay's objective to establish the usefulness of employing a critical historical perspective to better understand challenges to contemporary water management issues, there are two main ways that historic events continue to influence contemporary decision-making processes in the Mekong Delta. First, there is a phenomenon of what might be called institutional inertia where past institutional arrangements such as the reliance on private contractors to carry out public works since the 1880's have continued to shape the form of state decisions ever since. This first happened in immediately following the formal end of colonial rule in 1954 where old French enterprises continued to carry out public works construction to 1960. Besides the political motivations for continuing this mode of public works with the lobbying interests of entrepreneurs and the large sums of money involved in securing foreign development loans, there is also a corresponding physical inertia in terms of the historic built landscape and aging technology that works against propositions to make major changes in water resources strategy. As the colonial inspector noted in 1880, past works such as canals and sea dikes have become "works without end" that require continuing attention to maintain them against rising sea levels, changing river conditions, and fluctuating fuel prices. Entire

communities have become dependent on artificially maintained water levels and it would be politically difficult if not unfeasible for state leaders to require people living in such areas to become “friends with the flood.”

However, in the more environmentally contested zones such as the Plain of Reeds and the Ca Mau Peninsula where communities have always lived more on the edge separating prosperity from any number of natural and manmade disasters, perhaps there are more opportunities for state authorities to begin experimenting with more alternative, small-scale and adaptive strategies for coping with fluctuating environmental conditions and at the same time maintaining more stable economic and social conditions. The willingness of many to switch from riziculture to aquaculture, and the historic ingenuity of local people to evolve suitable and affordable technologies suggest there may in the future be many new economic and environmental opportunities to be gained from promoting rather than resisting such actions. Sansom’s story of one inventor above highlights both the rapidity with which delta farmers adopted a technology once proven and the enormous sums of money to be made, with no government subsidies involved, through the creation of new small-scale technologies. As the constant buzzing of diesel-powered boat engines and the crowded rivers of road traffic today attest, the Mekong Delta today is already a richly productive, vibrant zone increasingly shaped by local entrepreneurs and increasing access to foreign capital.

While most older residents today would suggest that times are generally better today than at any time in the delta’s modern past, the growing threats of climate change, upstream

changes in water availability and industrial pollution are raising new demands upon policy makers to respond in order to maintain standards of living and avoid future catastrophes of natural or social origin. These contemporary issues are not unique to Vietnam and the Mekong Delta but may be found in other river deltas around the world. In the Mississippi Delta, for example, the United States government is faced with similar problems in its efforts to rebuild the protective levee infrastructure around the city of New Orleans and prevent further subsidence of the delta area into the sea. By employing a more critical historical perspective on such issues, it may be possible to gain a clearer sense of both the institutional inertia that informs such decisions and possibilities that may exist for tapping into the incredible resourcefulness and ingenuity of people who have for decades had to adapt with little government support. By finding ways to democratize water resources policy-making and at the same time respond to changing environmental conditions without building new “works without end,” it may be possible for states such as Vietnam that rely so heavily on places such as the Mekong Delta for food and commerce to achieve more lasting economic and environmental security.