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Aerial Photography and Colonial Discourse on the Agricultural Crisis in Late-Colonial Indochina, 1930–1945

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FROM 1880 TO 1930, the French colonial government in Indochina supported rapid canalization and settlement in the recently cleared forests and marshes of the Mekong Delta (see map 4.1). The region's population increased fourfold in that era to more than four million persons, and the area of land put under cultivation expanded from roughly four hundred thousand hectares, consisting mostly of small landholdings along alluvial banks bordering creeks and rivers, to more than two million hectares covering much of the vast floodplains.¹ Despite this rapid reclamation campaign, when the global economic depression hit in September 1930, a free fall in rice export prices combined with several floods to produce what French economist Paul Bernard (1934, 123–24) called an “agricultural crisis,” a combination of economic, political, and ecological factors that left more than three million tenant farmers as well as many landowners bankrupt. The near-total confiscation of most rice stocks by plantation owners, needed to repay debts, triggered many local revolts. These peasant revolts in the Mekong Delta helped fuel a broader anticolonial agenda spearheaded by newly formed local cells of the Indochinese Communist Party.

In response to this complex crisis, French civil servants, agricultural engineers, and social scientists spent much of the 1930s formulating new approaches to the agricultural crisis in Cochin China. Of all the tools

used in their analyses, none were more effective in shaping public opinions and proposed solutions than aerial photography. In particular, aerial photographs comparing the abandoned terrain in the Mekong Delta to densely parceled landscapes in the Red River delta (see fig. 4.1) were very effective in shaping colonial policies. Human geographers such as Pierre Gourou (*Les paysans du Delta Tonkinois* [1936]) gained national and international notoriety for their detailed studies of traditional patterns of soil and water management, drawing extensively from aerial photography. Besides the catalyzing effect that this new “view over the village hedge” offered in an era of populist and reformist support for family farming, aerial photographs also were instrumental in hardening late colonial perceptions of traditional agriculture and the Tonkinese peasant in colonial research. Gourou’s “Tonkinese peasant” was in part a fabrication of Indochinese Orientalism, backed up with new evidence in the form of aerial photographs showing densely parceled, irrigated landscapes subject to the same Orientalist lens. This photo-aided imagination of northern peasants as heroic or superhuman ultimately played into Vichy-era and post-1945 programs to resettle thousands of northern farmers, from what was in many places a famine-stricken landscape, into the troubled wastelands of the Mekong Delta.

This essay addresses the role that aerial photography, in the hands of human geographers and other social scientists, played in the formation of two colonial ideals that had significant physical consequences for mass resettlement and infrastructure development in the Mekong Delta in the 1940s and throughout both Indochina Wars. Aerial photographs, as interpreted by Gourou and others, contributed to the formation of two dominant ways of “reading” nature in these intensely complex, human-altered hydraulic environments. First, comparisons of aerial photography between the two river deltas produced what I consider to be an Orientalist reading of human nature in comparing the ways northern and southern farmers managed water in two ecologically distinct river deltas. Gourou and many others were complicit in creating a myth that the genius of the intricate landscapes in the Red River delta was resident within northern peasants and that, in contrast, failure in reclaiming the Mekong Delta was due to the inherent “laziness” of southern farmers.



The Red River and Mekong River Deltas in Vietnam. Source: author.

The second “reading” that aerial photographs fostered was an equally potent misreading of built landscapes where social scientists assumed that the cellular system of locally managed dikes in the north could be reproduced with the same effects in the south (regardless of very different hydraulic conditions in these two environments). Aerial photographs combined with ethnographic studies in the north helped produce an idealized unit for government-sponsored development and resettlement: what scientists and engineers called a *casier*, an encasement of land and people within a surrounding flood dike. While early attempts to build such settlements in 1944 were failures, the idea of controlling both the environment and the community within such a social and environmental unit continued to animate successive resettlement attempts including such projects as *agrovilles* and strategic hamlets in the 1950s and 1960s, even several postwar collectivization schemes in the late 1970s.

Aerial Photography and French Geography in Indochina

Aerial photography, meaning oblique photos taken at a near-vertical angle of the ground below, were not common in Indochina until after World War I. The proliferation of surplus aircraft and cameras, combined with the development of aerial photography in the liberated areas of France, led to a gradual adoption of techniques and equipment in French colonies. Given the difficulties in accurately determining altitude in hilly areas, the Service géographique de l'Indochine (SGI) first developed photo-aided property surveys in the two river deltas where elevation varied only by several meters and where most of the valuable farmland was located. On January 1, 1926, SGI was reorganized directly under the governor-general, and both the northern Hanoi office and the southern Saigon office commenced a new 1/20,000 scale topographic survey using aerial photography in the two river deltas (Gouvernement générale 1931, 12–14).

SGI did not operate the flights, the cameras, or the subsequent rectification of the photographs. The Aeronautic Service, a branch of the colonial military service, had conducted this photography work

since 1922 within its larger mission to maintain aerial surveillance. In what was very likely an entrepreneurial move for the fledgling air squadron, pilots, photographers, and technicians previously employed during World War I sought to continue and expand the need for their services abroad. The funds and oversight of the photography mission, however, came directly from SGI. Thus, cartographers and the successive generation of human geographers such as Gourou were not working from military aerial reconnaissance photographs but instead poring over well-cataloged and relatively complete collections of photographs of both delta territories produced by a carefully articulated program in place by 1926 (Gouvernement générale 1922, 69).

Understanding why Gourou and others placed such primary importance on the local genius of individual farmers to alter their landscape is not possible without also mentioning the legacy of the French geographer Paul Vidal de la Blanche, who taught at the Sorbonne in Paris from 1898 to 1918 and opposed then-prevalent ideas of environmental determinism. Vidal de la Blanche fostered a young generation of social scientists and geographers who considered the importance of region and locality in their analyses of landscape change and economic development. Gourou, born in Tunisia, educated in Paris, and then assigned a teaching post at the Lycée Albert Sarrault in Hanoi in 1927, readily applied Vidal de la Blanche's ideas to the intensely human-influenced water landscapes he encountered in the Red River delta.² By combining this newly available medium—aerial photographs—with a new approach to understanding the role of human relationships in nature, Gourou and others commenced a new reading of delta people and delta environments in Indochina.

Imaging and Imagining “Heroic” Tonkinese Peasants

The bird's-eye view afforded by aerial photos shot over Tonkin shifted colonial knowledge of the hydraulic landscape by showing the interior spaces of villages and fields to be densely intricate patchworks of fields, orchards, hedgerows, and homes. The blank spaces on topographic maps were replaced with vibrant grayscale mosaics of fields, dikes, and



Figure 1. Casier. Landscape. The image above is an aerial photograph of the Red River Delta detailing the “cloisonné” of rice paddy encompassed by individual field dikes and then the taller *casier* of village dikes described by the thicker black lines in the photograph. At the top of the photo, an island like village is surrounded by trees and hedges and is located on a hill above the floodplain. Gourou studied hundreds of aerial photos generated by the colonial air force and the grouped villages into different types depending on their topographic and spatial configurations. Source: Indochina Military Air Service *op cit* Page 36, Pierre Gourou. *Les Paysans du Delta Tonkinois*.

villages. Engineers and scientists quickly recognized the value of such interior landscapes subdivided into so many cells of dikes and canals, and they used the term *casier* to describe this case-like landform.

An account of the power of aerial photographs to shift colonial scientists' interpretation of nature and the role of local people is eloquently stated by the geographer J. Y. Claeys, traveling through the Red River delta in 1940:

On the ground, even traveling at low speed on the roads, one does not see into the villages; one sees of it the small woods and hedges of high bamboos. The aerial view transforms these screens into plumes of palms planted in crowns tightly around the houses. The plan of the village is extremely variable. . . . Materially, the village is enclosed in its hedge of bamboos as hermetically as in its social rules . . . the greatest punishment that district prefects could inflict at the villages, as a collective punishment, was to make them raze this edge of bamboo. They still inflicted this sanction in the villages active at the time of the disorders of 1932 in the area of Vinh. . . .

The Tonkinese will always remain stubborn movers of earth. They were the ones who raised these dams and dikes that compartmentalize the delta into an infinity of casiers. In these casiers—Vidal de la Blanche too quickly calls them “natural” forgetting the human side in human geography—the bird's-eye view shows that the Vietnamese agricultural landscape is born of the masses, a characteristic fact. (1940, 45)

Aerial photographs not only redefined the landscape in visual terms, but in the hands of influential geographers they also redefined colonial understanding of the power and potential of local people.

Through the medium of aerial photography, this younger generation of colonial observers in Indochina modified older, Orientalist interpretations of the logic behind human-environmental relationships, what Mary Louise Pratt calls transculturation.³ One of the most impressive scenes for these interpretations in the Red River

delta landscape was the endless network of dikes encircling fields and villages that almost every year was menaced by floods.

The sight of thousands of farmers working day and night to protect their fields and villages from flooding brought frequent comparisons to masses of laborers constructing the pyramids in Egypt or the temples at Angkor Wat. Each dike was built out of millions of clay blocks, and some were several hundred years old. Women carried smaller blocks in baskets while men carried larger blocks on their backs. Six or seven thousand people might engage in construction or repairs to a dike, especially during the floods.⁴ This effort was a traditional communal duty, not typically paid or contracted out. Gourou made the important observation that while dikes protected the delta from floods, they also complicated problems of drainage—in effect causing the floods to rise higher. At Hanoi, the Red River rose from its lowest level of 2.8 meters above sea level to 12 meters above sea level during floods. Houses and streets in the city were at about 9 meters above sea level, while the countryside was generally lower.

Gourou's observations aside, most colonial writers in the period contributed wholesale to the expanding myth of the heroic Tonkinese peasant. André Touzet, on a mission from the home office in Paris, described one such scene:

One should see these instances of great danger that leave one speechless at the sudden buildup of the flood . . . to size up the fearsome mass of water rushing six or eight meters above the plain, villages, and cities . . . it is necessary to witness the defense against this invading water, to have participated with these armies of courageous peasants who fight from casier to casier, desperately, to save life and possessions. (1934, 239–40)

He praised the genius and solidarity of northern peasants, suggesting even that there were hints of Goethe in their *oeuvre* but without the assistance of “diabolical sorcers” (241).

This portrayal of northern peasants as “heroes,” however, contrasted sharply with colonial interpretations of the troubled landscapes populated with tenant farmers (many of them northern migrants) in

the Mekong Delta. One observer noted their lack of patience in clearing new lands, noting with frustration how people appeared to move ceaselessly—especially in the areas most affected in the agricultural crisis. They cleared fields one year and then abandoned them the next to cultivate elsewhere:

Rather than make an effort, tiny as it may be, they prefer to move in the province or to another, according to the climactic conditions, to put in culture lands possibly abandoned because they are too high or too low. The risks and the expenses that the *indigène* incurs because of these displacements are as large, if not more, than if he had remained on the plantation working just a little more. (Normandin 1913, 15)

Farmers in the Mekong Delta, thus, were described repeatedly as a kind of opposite personality to their counterparts in the north, never mind that many thousands of these farmers' families had come just twenty or thirty years before from the north, especially the delta provinces.

Administrators and geographers, however, did not only blame the victim in connecting the agricultural crisis to the disposition of southern farmers; they also frequently aimed an accusatory finger at colonial policies. The idea of a densely patterned casier landscape presented by Gourou and others from their studies in the north presented a measure by which to judge the successes and failures of colonial agricultural policies in the south. Provincial administrators and researchers adopted the idea that sustainable crop yields were associated with patterns of smaller landholdings and denser populations. One administrator in Long Xuyên noted that owners of smaller parcels in Mỹ Tho and Vĩnh Long doubled and sometimes tripled the one-ton-per-hectare average yield.⁵ He contrasted this pastoral ideal with the situation on the large estates, where an image of a verdant, intricate landscape of trees and fields was replaced by a treeless horizon with scattered clumps of “floating rice” growing in immense flooded zones. Houses were built against the banks of a canal or roadway. Workers came in small boats and lived there temporarily during a harvest. If their contracts were not renewed, they demolished the

house and carried the wooden piers to the next destination. Plantation owners failed to encourage tenants to settle permanently:

They never settle definitively, and consequently, what good is it to build a garden or plant fruit trees or bamboo from which others would profit? (Fraisie 1942, 140)

Even in defending the tenant farmer in the south, however, such observations failed to recognize the inherent hydraulic and ecological differences between the two river deltas, thus pushing too far the role of human agency in controlling flooding and fertility of soils in the Mekong Delta.

The single most influential work published during this period was Pierre Gourou's (1936) *Les paysans du Delta Tonkinois*. A meticulous study produced after years of poring over aerial photos and making trips into the delta countryside, *Les paysans* established Gourou as one of the most influential experts on agriculture and rural life in Indochina. With regard to water management in the Red River delta, Gourou noted that local farmers assumed responsibility for building and maintaining local dikes, noting that there was little need for the state to intervene in local flood prevention or irrigation. Instead, the colonial government in Tonkin had focused on improving commercial navigation and flood protection around Hanoi.

The new spatial perspective afforded by aerial photographs allowed Frenchmen such as Gourou a rare glimpse inside the village hedge, and he used this perspective to redefine and interpret village life into categories based upon his grouping of landscape patterns detected in the photos as well as drawings and studies prepared from more traditional, ground-level views. Gourou's quote below indicates the power that this new technology achieved:

In this Petri-like land of humanity, where man created everywhere the landscape such as we see it, the unity of the peasant population is powerful; the natural uniformity of the deltaic country has also played no small part in creating a human unity. Natural uniformity and human unity, by aiding one another,

have created a remarkably homogeneous land and a nation perfectly coherent. (1936, 14–15)

Gourou's metaphoric comparison of the Tonkinese delta to the microscopic terrain of bacterial colonies expanding across the flat surface of the petri dish reveals the intense confidence that colonial scientists and administrators felt in their ability to somehow steer these activities of Tonkinese peasants into the considerably more troubled petri dish of the Mekong Delta. The aerial photo offered a visual prop to Gourou's ideas of unity where individual farmers were reduced to microscopic size and importance in lieu of larger patterns of cultivation.

Casiers in the Mekong Delta

While the term *casier* conveyed the idea of a distinctively native construction in Tonkin, in the south it instead described a more distinctively colonial, industrial construction of protective dikes and canals, mostly produced by the Department of Public Works using advanced machinery and large teams of day laborers. Such constructions were often considered in contrast to historic agricultural landscapes in the Mekong Delta built from the natural ebb and flow of tides through winding creeks and along smaller rivers. Historically, there had been much less need for flood control in the Mekong Delta, especially in the densely populated alluvial regions. It was only after the expansion of several million hectares of land across the depressed western floodplains that flooding became a problem, each year swamping large tracts on the sprawling estates.

One of the most persuasive examples of a colonial *casier* was the Gressier Estate, one of the largest and most successful French companies in Cochin China. In 1903, Rémy Gressier built the largest rice mill in the delta at the center of a plantation covering some fifty-six hundred hectares of land, running fourteen kilometers on either side of a government-funded canal. State-of-the-art sluice gates and mechanical pumps lifted or drained water from a company-maintained primary grid of irrigation canals at one-kilometer intervals. The estate

was a terrestrial “chessboard” in which tenant farmers cultivated rectangular sections of land.⁶ At each one-kilometer intersection along the main canal bisecting the estate, residential hamlets were established with names that corresponded to their distance from the property boundary: One Thousand Hamlet (*Ấp Một Ngàn*), Two Thousand Hamlet (*Ấp Hai Ngàn*), and so on. Eight Thousand Hamlet at the middle of the property was also the location for the company’s central offices, the mill, shipping docks, a maternity ward, a school, and in the 1930s an airstrip. In each hamlet, the company operated general stores that took company scrip paid to tenants for their rice. Gressier even briefly operated an agricultural training school in hopes of turning out future farm managers willing to oversee expansion of the estate.⁷

A local mill owner living near the old estate recalled life on these large company plantations:

Before ’45, there were some big plantations like Cơ Đổ of Huỳnh Kỳ in the Mekong Delta, Gressier in Xà No, and some other large French plantations in Bạc Liêu. . . . They all had technology—machinery, water pumps, and plows. When landlords lent land to farmers, farmers just bought buffaloes to plough their fields—they did not use any machines. Agriculture developed up to the edge of each rectangular plot [casier]. The plantations developed faster than other land. . . . Gressier cleared several thousand hectares in this region, expanded his plantation, dug canals like a chessboard. . . . All water was conducted through this rectangular scheme, and all canals had dikes. When they wanted to bring water in, they turned the flap gate in; when they wanted to rinse water out, they turned the flap gate out. . . . They turned the flap gates out when the harvest came to clear the water and dry the fields. At low tide water drained out; at high tide [the flap gates blocked it so that] it could not enter. The system was perfect because it covered the whole area. They could decide the field to be dry or wet easily. . . . Very scientific. . . .⁸

In hydrologic and agricultural terms, Gressier’s operation was successful, though few planters could afford the machines and labor

necessary to maintain such a casier on their own. The planter Robert Labaste experimented with water pumps and dikes around his smaller estate, and he built a mill as well. After consecutive years of flooding from 1909 to 1912, however, he sold the pumps to the provincial government and reduced his holdings to his residence.⁹

During the agricultural crisis surrounding the Great Depression in the 1930s, while numerous researchers and officials criticized the reckless manner in which wealthy landlords and government engineers had developed the system of canals and treeless estates in the Mekong Delta, most continued to emphasize the promise of industrialized agriculture. Gressier's estate and a few others served as powerful examples of the benefits derived from scientific or corporate management. Instead, observers cited a failure of small landholders to invest in such infrastructure and they noted the tendency of tenants to move around from one estate to another.

As criticisms of colonial agriculture increased and comparisons to the relatively sustainable landscapes of the Tonkin delta were rendered more telling through aerial photography, officials, engineers, and social scientists attempted to fuse together what they understood about indigenous patterns of cultivation and water management in a new hybrid form: the resettlement casier. Responding to a wave of violence caused by the dispossession of several thousand ethnic-Khmer villagers from traditionally held lands, the Department of Public Works attempted to construct a grid of canals and encircling dikes in a forested portion of the delta that had yet to be reclaimed. From 1930 to 1933, the government granted five-hectare and ten-hectare plots of land in this area to predominantly Khmer people. Public Works completed the primary grid of canals before the migrants (called *petit colons* in the newspapers) arrived.

Hundreds of families rushed to gain legal title to these plots (on Tri Tôn, Rạch Giá–Hà Tiên, and Ba Thê Canals). Demand far exceeded the available number of lots, requiring use of a lottery system to distribute parcels. The government prohibited settlements within one kilometer of major canal intersections, reserving this space for police, navigational constructions, and commercial leases. In the forested interior zones of these casiers, settlers cleared more than

100,000 hectares in just three years. Deforestation was aided by disastrous fires that incinerated the thick layers of peat soils. Concerned by the increasing dredging costs and the uncontrolled destruction of forests, the government closed the project in 1933.¹⁰ Large tracts of state-owned forest beyond the casiers had also been reduced to ashes, and within a few years, many migrants left the casiers because floods and acidity had rendered the land unproductive. The dredging contractor also reduced its operations to 25 percent capacity in 1934 during the worst year of the economic crisis.¹¹

For the rest of the decade, one with intense political shifts in France as well as Indochina, few new projects were attempted. Following the election of a Popular Front government in France in 1936, a number of new measures were passed by the Colonial Council that reflected shifted priorities toward a more popular form of agricultural development in the river deltas. Ironically, it was an empowered group of reformists, including those in recently legalized, Vietnamese political parties, who continued to push the government in Cochinchina to establish more resettlement casiers in the Mekong Delta.

The Parti Démocratique Indochinois, a moderate pro-reform group in Sài Gòn, petitioned the governor to continue building more settlements:

This work, the utility and urgency of which are shown by the havoc of the flood, is likely to bring work and an immediate help to the populations of the disaster victims. . . . From the political point of view, this convenient gesture of the authorities, coming to the assistance of populations who have proven their work to be valuable, will have a considerable effect. Regarding social aspects, we know too well how misery is often a bad adviser. He risks being exploited by adversaries of the current regime, partisans of the class struggle and enemies more or less declared against French influence in Indochina. They will be too happy to appeal to the worst instincts, on a ground already prepared by disappointments and deprivations, to destroy the social order.¹²

The old coalition that had supported government intervention in building dikes and canals—promoters of an industrial hydraulic

landscape—was now augmented with an unlikely group of new allies—native political activists, left-leaning reformists, and displaced tenants. While the colonial government took considerable steps in addressing the environmental, economic, and political crisis in the Mekong Delta, including laying out ambitious plans to resettle some thirty to fifty thousand tenants and northern migrants into casiers, it did not carry out any significant new works before the collapse of the Third Republic to the Nazis on June 17, 1940.

Fascist Approaches to the Crisis: Casiers Tonkinoises

The subsequent establishment of a Vichy government in Indochina resulted in the isolation of reformist French officials and the violent suppression of Vietnamese nationalists. The five years of Vichy administration from 1940 to 1945 are perhaps the least understood in Vietnam's colonial history with respect to rural conditions and land development. Wartime demands of the Vichy government and its Japanese military rulers caused widespread shortages of basic supplies and fuel. My interviews with elder farmers confirm David Elliott's description that the countryside "fell into darkness, both figuratively and literally" (2003, 33). The Japanese military controlled access to fuel, fabric, and medicine; and supplies of these basic goods for rural consumption all but disappeared.

Within the Vichy government during this period from 1940 to 1945, engineers, scientists, and officials spent much of their time debating ideas about land tenancy and future economic development, especially in the Mekong Delta. It was in this era that earlier readings of nature were refined into more-repressive forms that in the decades following World War II took such forms as agrovilles and strategic hamlets. In the world of colonial offices, limited by the Japanese imperial military and a growing crisis in the countryside, debates emerged between the agricultural engineers (*Genie Rurale*) and the hydraulic engineers (Public Works) over the causes of the agricultural crisis in the past decade. Agricultural engineers blamed Public Works for its failure to construct waterways and develop the delta in any logical

fashion. In a paper titled “Problème du Riz,” they criticized plantation owners and Public Works engineers for their absence from actual work on the land.¹³

The large waterways had come to represent ecological folly, as Public Works engineers had not sufficiently planned for the contingent effects of a new waterway on existing lattices of secondary works. The agricultural engineers argued that Public Works used no comprehensive logic in planning their projects but instead succumbed to special interests.¹⁴ Irrigation, they argued, should instead fall under local jurisdiction as had happened with agriculture in France and as happened in Tonkin. Neither Public Works nor the dredging contractor could fully appreciate locally complicated questions of an agricultural nature; instead they tended to expand new canals that served the speculative interests of their constituency—powerful landowners and bureaucrats in Sài Gòn.¹⁵

Meanwhile, Public Works engineers argued the opposite case in support for more centrally managed projects. They discredited the agricultural engineers on technical grounds and for writing such “pessimistic reports” with catastrophic conclusions such as “All of Cochinchina is in danger.”¹⁶ Engineer Bigorgne reinterpreted rice statistics to argue that ten-year averages from 1924 to 1934 and 1934–44 had actually increased from 2.0 million tons to 2.9 million tons. Annual outputs also varied due to natural conditions, especially in years of high floods or long droughts. He attributed irrigation problems and abandoned lands in part to local practices in the newly opened regions. Unlike farmers in Tonkin, farmers in the Mekong Delta irrigated fields with rainwater, and they refused to build irrigation and drainage channels in cooperation with their neighbors.¹⁷

It was in this moment, in 1943–44, that a struggling Fascist government under Japanese military oversight adopted older ideas of the “heroic Tonkinese” shaped by the “view over the bamboo hedge” offered in aerial photographs and Gourou’s publications to attempt a radical new reworking of nature and society in the Mekong Delta. The Vichy colonial government adopted older land redistribution and family farming campaigns initiated in 1938 by the Popular Front government and reworked them to create a kind of scientifically managed

settlement grid, the *Casier Tonkinoise*. The Casier Tonkinoise aimed at relocating peasants directly from crowded northern delta provinces into new experimental settlements not far from the earlier Khmer settlements that had ended with the forest fires and protests in 1938.

Public Works engineers (with agricultural engineers conspicuously absent) drafted plans for a *Premiere Casier Tonkinoise* in 1943.¹⁸ The plan combined the “genius” of Tonkinese peasants with an infrastructure that would be constructed with mechanical dredges, maintained with diesel water pumps, and further augmented by the modern technology of French enterprises. This was to serve as a model settlement, a kind of agro-utopian city, ideally attracting locals to copy the same patterns and thus propagate a new kind of landscape and society in the region. In keeping with what Eric Jennings (2001, 17) describes as the “neotraditional” tendencies of Vichy, the Casier Tonkinoise was an attempt to rapidly convert the Mekong Delta landscape into the cellular landscapes of the north, albeit strengthened with the rumbling of new machines. The settlement also featured such progressive features as a maternity ward, a school, and a sports stadium.

A workforce consisting of both Tonkinese migrants and local day laborers completed the main canals in the *Premiere Casier Tonkinois* on August 20, 1943. Tonkinese immigrants and local workers together had dredged a grid of irrigation canals 13 kilometers by 3 kilometers. Seven hundred fifty families (approximately 3,800 people) voluntarily moved there from Thái Bình and Nam Định Provinces. Each family received new clothes, mosquito netting, raincoats and hats, blankets, and matting upon arrival. They received a five-hectare lot upon finishing construction on the main canals. They received a hot meal upon arrival, one month’s supply of food, cooking supplies, farming tools, and a small boat. Besides these personal amenities, the government established a school, an administrative center, a market, and a *đình* or communal meetinghouse. The sports stadium was to be built later in the year. The casier would then serve as the focal attraction for independent migration.¹⁹

Within a year of the project’s completion, farmers had cleared one-third of the land, removing and burning twisted melaleuca stumps from the clay before they planted rice. Unfamiliar with either the tidal

or flooding regimens, they dug deep canals to drain waters outside of protective field dikes. In this way, they avoided flooding, but as the dry season progressed, water levels dropped severely in the spring, and they were unable to bring enough water into the fields. The rice crop then suffered from drought and the buildup of alum. The government spent more than 175,000 piastres on the experimental project in just one year.²⁰ Believing that in one more year this first casier would be self-sufficient, the government started building a second settlement in 1945. This area mirrored the first casier on the opposite bank of the main canal; and immigrants arrived several months later, just as the Vietminh claimed independence for Vietnam in August 1945.²¹ Work on the projects then stopped with the Vichy government's collapse, postwar struggles with the Vietminh, and the violent restoration of French control in the delta in early 1946.

Conclusion

Though French engineers abandoned the casiers as military forces fought for control of the territory, the idea of casiers as a hydraulic and social engineering model persisted well beyond 1945. Public Works engineers had drawn up plans for much larger, future projects in other environmentally and politically contentious regions such as Đồng Tháp (Plain of Reeds), Long Xuyên, Bạc Liêu, and U Minh/Cà Mau. They believed that these projects would ultimately permit them to “fix the type of water management for the region.”²² To many French, Vietnamese, and, a decade later, Americans, the casiers represented a compromise situation for appeasing peasants and stabilizing agricultural development, while nevertheless continuing to promote the role of industry and government contractors. Like the large canal projects before 1930, settlements continued to require heavy inputs of machinery, engineers, and new outlays for farm equipment.

Colonial ideas about landscape and agricultural development in the Mekong Delta, particularly the government's focus on development of casiers after 1930, were charged with a new idealization of northern peasants and the northern landscape as depicted in Pierre

Gourou's influential works and in the thousands of aerial photographs he used to develop his arguments. Photography combined with a new turn in humanist geography to offer new views into what Gourou and others believed was the locus of such landscapes—the mass labor and inherited traditions of human communities that for most of the colonial era had been insulated from colonial modes of agriculture common in the south. Aerial photography alone did not push these ideas, but rather it offered seemingly unassailable proof that the forms of land use in the northern deltas were mostly the result of human action and not the more common view before 1930 that society was instead a product of the delta environment.

This subtle turn in understanding human-environment relationships in the 1930s was an important one with far-reaching consequences in successive decades, not only in Indochina and not only at the hands of the French, Vietnamese, or Americans. Humanist geography in the tradition of Vidal de la Blanche's and later Gourou's writing supported a belief in the possibility for human communities, either through local genius or aided by machines, to shape a given environment into a desired and sustainable form of agricultural production.

While this was an important moment in questioning an earlier faith in the deterministic power of the surrounding environment, these ideas were quickly adopted by technological positivists, Fascists, and Socialists to justify new endeavors that failed for not acknowledging the environmental limits to specific projects. Gourou's study of Tonkinese peasants supported rather than contradicted the faith of engineers and the colonial government in scientific management. Such studies on settlements were simultaneously popular with anticolonial Vietnamese nationalists and reformers who believed that a radical redistribution of land into small holdings would in turn produce a productive, small-farm landscape populated with an agricultural proletariat. They frequently held up settlement casiers as a peaceful means of relocating the poorest farmers and stemming the growing trend toward violence against plantation owners and the government. Vichy engineers and supporters of a French-backed State of Vietnam in the late 1940s continued to emphasize such projects as the Casier Tonkinoise as evidence of the benefits to be gained by supporting a quasi-

colonial, quasi-independent government—all the while ignoring the catastrophic consequences of the projects in environmental terms.

The Mekong Delta was not only bound by legal problems in land ownership or the disproportionate influence of wealthy landowners and Public Works engineers, but it was also still subject to environmental conditions that differed greatly from the northern deltas. What both Vietnamese nationalists and French Fascists ignored in this period was the continuing role that local ecology and the river played in undermining various model developments borrowed from elsewhere. In the process of attempting to construct a “cloisonné landscape” as depicted in the bird’s-eye views of the Tonkinese landscape, engineers and contractors, together with thousands of new immigrants, continued the erasure of older water-management practices and social relationships that had governed land use before the onset of plantation agriculture; meanwhile, they imported a form of landscape often subject to catastrophic flooding.

The French government had since 1879 acted to limit and undermine local forms of land ownership and land use by putting traditionally settled areas into a separate legal category from French lands, thus rapidly diminishing the authority of traditional institutions. Reestablishing such patterns of traditional landownership and village culture after fifty years of dualism in Cochin China was an impossible proposal. Instead, land reform hinged on the idea of transplanting a northern landscape into the southern delta. Planners of the Casier Tonkinoise attempted to create a neotraditionalist agricultural landscape, reinventing what they perceived of the traditional agrarian past as seen in Tonkin, although now aided with machinery and the guiding hand of the state. Projects such as the Casier Tonkinoise borrowed their logic from landscapes believed to be both “natural” and “traditional” while they were inevitably subject to the colonial politics of land ownership and the unique water conditions of the Mekong Delta.

This essay makes a case for understanding how a specific new technology, aerial photography, empowered not only shifts in notions of the role of humans in the environment but also successive changes in the approaches of colonial governments to land abandonment, rural poverty, and environmental degradation. The specific relation-

ship between photographs and such projects as the Casier Tonkinoise or later resettlement efforts such as agrovilles was not causal but indirect and more complex; a general shift in colonial reading of the environment precipitated by the “view over the village hedge” that aerial photographs offered in the 1930s helped fuel the creation of a “neotraditionalist” ideal toward rural development—one that assumed that humans with sufficient labor or technology could sustainably manage their environment and one that capitalized on a somewhat nostalgic longing for a pastoral ideal as represented in the family farm—this was especially true during Vichy rule. With regard to the discussion by Christopher Morris in this volume on whether colonial engineering generally aimed to “get the people out of nature,” evidence from the casiers suggests that late colonial engineering in the 1930s and 1940s attempted to redress earlier displacements by reinserting people into a given environment, but one that could be easily manipulated and watched by the state. Aerial photography provided the “eyes in the sky” for the state, allowing social scientists and officials alike to feel that they could then manage the activities of people who, before 1900 and until 1930, they had worked so hard to displace from their precolonial settlements. Especially in the case of Vietnam, aerial photography and other forms of remote sensing after 1945 became the only reliable source of land-use data as the countryside continued to slip into the hands of the Vietminh and the National Liberation Front after 1960. Despite occasional internal debates in the 1930s and later during American occupation, government officials failed to respond to the fact that the failures to achieve sustainability or realize development in the countryside were not so much failures in choosing one form of settlement or another but instead were the continuing failures to connect to social and economic realities on the ground.

Notes

1. Figures for land areas cultivated in the Mekong Delta can be found in an Indochinese government publication (1930): *Dragages de Cochinchine*, 20.

2. For Vidal de la Blanche's opinions, see Vidal de la Blanche, *Principles of Human Geography*; and Berdoulay's account of the Vidalian legacy in "Place, Meaning and Discourse in French Language Geography," 125–28. For a concise biography of Gourou, see Bruneau, "Pierre Gourou (1900–1999)."

3. See Pratt, *Imperial Eyes*. Particularly in chapter 6, "Alexander von Humboldt and the Reinvention of América," she describes how von Humboldt's publication of thirty volumes on South America defined European and modern South American ideas of culture and nature in the region.

4. Gourou, *Les paysans*, 88–89.

5. Xacat, "Riziculture et Hydraulique Agricole," August 29, 1944, Southern Delegate (TDBCPCNV), Vietnam National Archives Ctr 2 (TTLTQG2), H.6/20.

6. Gressier's total holdings varied with land sales over the years, but his firm's total holdings may have exceeded 140 square kilometers (14,000 hectares) during the "agricultural crisis." An exact figure is difficult to assess because land was both sold and purchased at different times. The "casier" of Gressier land, however, was controlled by Gressier and his heirs until 1945. The Gressier Concession was originally formed by the former administrator of Rạch Giá, Guéry, who requested the land in 1899 and then sold it to the Gressier company. *Plan Topographique de la Province de Cantho*, 1/100,000 (Hanoi: Société Géographique de l'Indochine, 1925). A total of 2,800 hectares (7x4 kilometers) were located on the Cần Thơ side of Xà No, and approximately 2,800 hectares were located in Rạch Giá Province. An unpublished 1963 map of landholdings still claimed by French nationals shows the same area in Cần Thơ and Chương Thiện Provinces was still claimed by Gressier heirs. A 1936 provincial monograph lists the total size of Gressier holdings as 12,049 hectares. Adding 2,800 hectares from Cần Thơ gives a total of 14,849 hectares owned by the Gressier Estate, probably from the early 1900s to 1945. See "Monographie de Rach-Gia," TTLTQG2, TDBCPCNV E.02/71.

7. Brocheux, *The Mekong Delta*, 133.

8. Ông Diểu, interview by author, April 19, 2002..

9. Services Agricoles et Commerciaux, "Visite Faite Les 1er et 2 Mai à l'Exploitation Rizicole de M. Labaste," May 29, 1912, TTLTQG2, Fonds Goucoch IB 25/124.

10. Administrator of Rạch Giá to the governor of Cochinchina, December 7, 1932, TTLTQG2, Fonds Goucoch IB23/096 (19).

11. Annual expenditures for dredging from 1930 to 1937 were as follows: 1930: 1.75m piastres; 1931: 1.75m piastres; 1932: 1.4m piastres; 1933:

.8m piastres; 1934: .4m piastres; 1935: .4m piastres; 1936: .45m piastres; 1937: .4m piastres. "Dragages dans les canaux de Cochinchine: Concours pour l'exécution de travaux de dragages en Cochinchine pour une période de dix ans," TLTQ2, Fonds Goucoch VIA 8/186(31).

12. "Le President du Parti Democrate Indochinois a Monsieur le Gouverneur de la Cochinchine," April 6, 1938, TLTQ2, Fonds Goucoch VIA 8/207(21).

13. Hoeffel, "Le Riz," TLTQ2, TDBCNPV H6/20, 3.

14. Xacat, "Riziculture et Hydraulique Agricole," August 29, 1944, TLTQ2, TDBCNPV H.6/20, 1.

15. *Ibid.*, 7.

16. Bigorgne, "L'Hydraulique Agricole en Cochinchine," August 25, 1944, TLTQ2, TDBCNPV H.6/20, 1.

17. *Ibid.*, 5.

18. L'Ingenieur en Chef de la Circonscription d'Hydraulique Agricole et de Navigation de Sud-Indochine (HANSI) a Monsieur le Gouverneur de la Cochinchine, September 1, 1943, TLTQ2, TDBCNPV BO/3904.

19. *Ibid.*

20. L'administrateur, chef de la province de Rachgia a Monsieur le Gouverneur de la Cochinchine, January 22, 1945, TLTQ2, TDBCNPV BO/3904.

21. Budget Generale: Aménagement de la Region Rach-Gia – Ha-Tien, January 25, 1945, TLTQ2, TDBCNPV BO/3904.

22. Jamme, "Aménagement de la Plaine des Joncs: Avant-Projet," July 20, 1943, TLTQ2, TDBCNPV H.62/7, 14.

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Goucoch: Gouvernement de la Cochinchine, the French colonial government at Saigon from 1879 to 1949. Records stored at Vietnam National Archives Center 2, Ho Chi Minh City.

Southern Delegation (Toà Đại Biểu Chính Phủ Nam Việt): The southern regional representative at Saigon (1949–55), affiliated with the State of Vietnam under Emperor Bao Đại. Records stored at Vietnam National Archives Center 2, Ho Chi Minh City.