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from multiple perspectives within and beyond the academy.

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The cover image is of Delta of the Yellow River, China (top) and Delta of the Zambezi River, Mozambique (bottom). Landsat imagery courtesy of NASA Goddard Space Flight Center and U.S. Geological Survey.

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FEATURE

RIO YAQUI-THE HIAK VATWE: THE TRANSFORMATION OF A CULTURAL LANDSCAPE

By Anabel Galindo and James Hopkins

In 2017, an ecological, cultural, and public health crisis is unfolding in northwestern Sonora, Mexico in which Yaqui people face daily

challenges to access clean drinking water where noxious elements litter an endangered cultural landscape. The problems that overwhelm the



This 1920s aerial view of the Hiak Vatwe flowing through a traditional Yaqui village shows the magnitude of the river before dams and irrigation infrastructure were built in the 1940s. Image courtesy of Fideicomiso Archivos Plutarco Elías Calles y Fernando Torreblanca, Mexico City.

Yaqui communities today are a direct result of the historical relationships and the conceptual views about the Yaqui River. For Yaqui people, the Yaqui River, or what is known traditionally as the *Hiak Vatwe*,^[1] is a landscape that reflects a deeply rooted cultural and spiritual connection that explains the origins of life, social values, and the intricacies that shape Yaqui identity.

During the early seventeenth century, as foreigners arrived and settled in northwestern Sonora, an ideological polarity emerged. The Spanish witnessed a seemingly endless water source with

abundant surface water and fertile soils that had long made the *Hiak Vatwe* a true gem in the desert. The *Hiak Vatwe* landscape was central for the colonial agenda to transform a semi-arid desert ecology into a coastal agricultural haven that would give way to inland campaigns for precious minerals. With a diverse ecology and riverbanks of loamy, mineral-rich soils, the *Hiak Vatwe* was comparable to the Nile River; without hesitation, the eighteenth-century Jesuit priest, Father Nentvig, baptized it as the Nile of Sonora. The plentiful natural riches in the region made it possible for the Spanish missionaries to settle,



Figure 1: Photograph of about a dozen head of cattle fording the wide placid river, Rio Yaqui, in Mexico, ca.1900. The surrounding landscape is very flat, with no vegetation on the near shore and low vegetation on the far shore. Image from the California Historical Society Collection at the University of Southern California, via Wikimedia Commons.

evangelize, and gradually create a commercial economy. Spain's colonial practices introduced a process of commodification of the *Hiak Vatwe* landscape, introducing agricultural techniques, seed varieties, domesticated animals, and the excavation of ditches and channels to best control the river course.[2] In other words, the Spanish sought to rationalize the use of the landscape by controlling land and water resources thought to be misused by its Indigenous inhabitants, whose technology often exhibited more natural methods of consumption.[3] By the end of the eighteenth century, economic and political pressures incited an independence movement that aspired to sever

the ties to the Spanish crown and eliminate the colonial privileges, especially those enjoyed by the church, such as communal land holdings.

The path to becoming a nation was not an easy one; decades of internal strife and two foreign interventions left Mexico crippled with a debilitated economy and half its territorial size. [4] Despite all the chaotic turn of events, the liberal politicians at state levels adopted laws that enabled the division of communal lands favoring large landowners. But it was the *Lerdo* Law under the Constitution of 1857, that systematically ruptured the communal land system.



Figure 2: These historical aerial views of the Hiak Vatwe flowing through Torim and Bacum, two traditional Yaqui villages, show the magnitude of the river before the dam systems and extensive irrigation infrastructure were built in the 1940s. The images date from the 1920-30s; Yaquis were attacked by aerial strikes during the period 1926-29. Images courtesy of Fideicomiso Archivos Plutarco Elías Calles y Fernando Torreblanca (FAPECFT), Mexico City.

The privatization of communal lands threatened the ability for Indigenous communities to access pastoral lands and woodlands (Tutino 1989, 262). The Diaz regime (1876-1911) hastened the transformative agrarian process with scientific explorations that identified potential lands and rivers for technological development. Moreover, it legalized the rational use of space. Lands not in production were considered mismanaged. Vacant laws and policies legally appropriated lands and Indigenous peoples were alienated from their cultural landscape, deprived of their rights, sustenance and yet simultaneously peons in their lands, if not forced to migrate to urban centers. [5]

The ideological polarity established during the colonial era deepened in the nineteenth and twentieth centuries with convictions of dominance over natural resources and seeing the landscape as capital mode of production. Steven Bourassa argued that a Eurocentric view of space and landscape is mostly shaped by notions of power (Bourassa 1991, 5). In this model, the power that resides in the hands of individuals with an identity that is not defined by a connection to the landscape undervalues peoples' interconnectedness and relations to that space. As a nation, Mexico's historic land tenure and natural resource policies generated a political and economic disparity between Indigenous peoples



Figure 3: These historical aerial views of the Hiak Vatwe flowing through Torim and Bacum, two traditional Yaqui villages, show the magnitude of the river before the dam systems and extensive irrigation infrastructure were built in the 1940s. The images date from the 1920-30s; Yaquis were attacked by aerial strikes during the period 1926-29. Images courtesy of Fideicomiso Archivos Plutarco Elías Calles y Fernando Torreblanca (FAPECFT), Mexico City.

and their access to communally held lands. The polarization enabled the state to dictate and often sacrifice the future of Indigenous cultural landscapes.

At the turn of the twentieth century, foreign traveler accounts popularized and in many ways justified the violent physical removal and the cultural alienation of Yaquis from the *Hiak Vatwe* by framing the Yaqui Wars as an inevitable course in the name of progress. The once “lush cactus forest”[6] would soon become the farming wonderland of Mexico. Reports encouraged foreigners to invest, emphasizing the potential for economic opportunity with large tracts of irrigated land available free of menacing threats from Yaqui people. The reports often minimized the violence, vilified Indigenous peoples, and justified the legal dispossession from Yaqui people. After nearly four decades in power, the social, political, and economic inequities that plagued the nation under Díaz were a catalyst for the Mexican Revolution. Order and Progress (slogan for the regime) had come at a price for the nation, but it was the pressures of land tenure that was pivotal for the revolutionary movements.[7]

As a result of the Mexican Revolution, Article 27 of the 1917 Constitution became the watershed of the modern twentieth-century agrarian reform. The delegates strived to amend the social ills of the previous century and addressed issues of tenure and distribution of land and water. It confirmed Mexico’s claim to exclusive ownership of all natural resources including land, water, and the subsurface, declaring Mexico as the undisputed gatekeeper, sole legal proprietor, and titleholder authorizing the uses of public lands. It also established a legal framework, *ejidos*—land held in commune, this model system was in theory a milestone of communal ownership and resource management efforts; it also prevailed as the institutional construct for addressing the use of land, but not the inalienable rights to land, for the developing modern Mexican agro-economy.

By the 1930s, Article 27 had proven inefficient. It did little to nothing to recognize the inalienable claim to tenure, land use, and water management by Indigenous communities like the Yaqui whose identity is inseparable from their cultural landscape. Land distribution was disparate and inefficient, benefitting large landowners rather than the Indigenous or mestizo peasants. President Lázaro Cárdenas in 1934 re-ignited distribution and strengthened the *ejido* model by establishing the National Credit Ejidal Bank (BNCE) to provide support for year-round operations. He also broadened a modernization plan for the countryside, where the small farmer would become the backbone of the Mexican economy and leader in the progression of the nation. The BNCE channeled technical support, facilitated credit lines, and organized local producers with consumers. It controlled every aspect of the agricultural process, creating a bureaucratic dependency that dictated what, when, and how to farm (Hewitt de Alcantara 1978, 250). The *ejido* model displaced cultural relations and accelerated a system that in theory intended to individuate rights for use and profit, but *ejido* farmers became indebted to its bureaucratic authority. Superficially, the *ejido* governance served as Indigenous communal tenure, a close cultural match, but in reality, the system ignored customary practices and denied support when these practices concerned sustainable use of traditional resources that differed from the bank directives. Bourassa’s concept of individuated power stalked Article 27 for a century as subsequent reforms focused on incentivizing individual *ejido* members to make greater economic gains and rewarding those gains with increased ownership in the organization, while at the same time weakening the same communal system it represented. Power dynamics, resource management, and land tenure became entangled in the bureaucratic maze.

The *Hiak Vatwe* was no exception. After decades of violence, turmoil, and war against Yaqui people by the Mexican government, the permanent transformation of the *Hiak Vatwe* was inevitable.

Although Yaqui people gained some latitude with President Lázaro Cárdenas's recognition of territorial boundaries and water rights of the soon-to-be-dammed river in 1938, they lost traditional claims to ancestral lands that extended beyond the 485,000 hectares of the "new" government-defined boundary.[8] Furthermore, this arrangement led to the permanent commodification of the *Hiak Vatwe* landscape as the territory integrated into the agricultural scientific exploration shaped by the Green Revolution of the 1940s to 1960s. This technological progression shaped the countryside; modern marvels not only defied, but dominated nature with permanent structures that diverted natural streams and captured the waters of prominent rivers. The *Hiak Vatwe* was captured in a colossal construction of its time: the *Angostura Dam* built in 1941 (1 of 3 dam systems damming the river). Mexico, like many other developing nations, pursued a solution to concerns of food scarcity by adopting new technology and infrastructure intended to advance output production. Political leaders, like Cárdenas, envisioned an agro-cultural society with modern tools rather than rudimentary and traditional modes of farming. The introduction of large machinery, higher yielding strains of grain seeds, and increased pesticide use facilitated the exponential growth of an export economy that replaced traditional ecologies of farming, culture, and connectivity. The concept of time also revolutionized the process; what may have taken a Yaqui farmer weeks of preparation, seed manipulation, and other customary practices to ensure a plentiful harvest was replaced by an accelerated farming process that ignored these traditions. No longer was the mythical and sacred *vovok* (a toad) used in a procession across the fields to call upon the rain for a bountiful harvest (Valencia 1985, 41). This mythical figure symbolically connects Yaqui farmers with the landscape, the natural elements, and in many ways exemplified the cultural connections. A customary practice like this was inefficient in a commercial agricultural process.

Additionally, while Yaquis were able to secure a land base, the redistribution favored the neighboring non-Yaqui *ejido*, known as the Yaqui Valley. It overshadowed the irrigable surface area of the Yaqui communities, not only in size, but also in available resources (Hewitt de Alcántara 1978). The valley became the cradle of the Green Revolution movement, and the non-Yaqui farmers soon benefitted from hydraulic infrastructure with access to both surface and groundwater sources. As recipients of new technology, hybrid seeds, and pesticides that ensured rapid and hearty harvests, their immersion in the commercial economy enabled the Yaqui Valley farmers, not Indigenous Yaqui farmers, to become the export agricultural model.

The results of the Green Revolution and the policies that once envisioned a pastoral agricultural society transformed the rural landscape into a drought-stricken mono-crop farming dependent on excessive groundwater pumping to meet the demands of an export economy (Hewitt de Alcántara 1978). The destruction has been further augmented by the excessive use of pesticides and agro-chemicals whose residuals dump into the water table and subsurface and thus expose the Yaqui population to contaminants. By the 1970s, the limitations, inefficiencies, and unsustainability of the Green Revolution were evident (Sonnenfeld 1992, McCully 2001). Mexico's attempt to generate a modern agricultural society resulted in environmental degradation affecting the flora and fauna from the *Hiak Vatwe* landscape up to the coastal waters; excessive groundwater pumping; alterations to traditional foods by producing and consuming export crops; substitution of Yaqui customary traditions and practices; deepened social and economic disparity as Indigenous farmers had unequal access to credit, loans, and technology; and alarming rates of health-related issues. In addition, the *Hiak Vatwe*—irreparably drained and diverted—is perhaps the most acute recorded instance of ocean inland intrusion on the North American continent. The Pacific Ocean

has claimed 30 kilometers of riverbed and destroyed more than 800 square kilometers of the Yaqui delta's coastal aquifer. The decline of the *Hiak Vatwe* and its delta parallels a deteriorating human rights situation resulting from population growth in Sonora's Pacific coastal region, as well as the internationally contested role and uses of the Yaqui River Basin as the largest shared basin between Arizona in the United States and Sonora in Mexico.

In 2017, the *Hiak Vatwe* is still a zone of contention and violence over the landscape, villages still lack potable water services, the marginal Yaqui farm lands are mostly farmed by non-Yaquis,[9] and Yaqui villages like Potam are exposed to high levels of arsenic in the land and water sources.[10] The pressures have intensified with the development of an aqueduct, dubbed "Independence," which diverts volumes of water from the *Hiak Vatwe* stored at the Novillo Dam, to quench the needs of the dry stricken state capital of Hermosillo. Mobilizations against the construction of the aqueduct and the political

turmoil over the usage of the water for commercial rather domestic use are now overshadowed by the most recent violence, the construction of the gas pipeline that will traverse the *Hiak Vatwe* landscape. These recent transformative constructions threaten the well-being of Yaqui communities and the *Hiak Vatwe* today, but also in the near future, with perhaps irreversible damage.

In conclusion, the historical transformation of the *Hiak Vatwe* landscape is grounded in the power dynamics of Mexico's sovereign patrimony exercised over its territorial boundaries. The complexity of land and water policies enabled the Mexican government to control every aspect of water management, land tenure, and redistribution and development of natural sources in the country. Bureaucratic institutions established to determine the allocation of resources resulted in a process that was not only limiting, but disastrous for Indigenous communities. These institutions were ill equipped to address the overarching concerns of tenure, access, and the inalienable



Figure 4: Agricultural fields near Potam, Rio Yaqui (2015). Image by Anabel Galindo.



Figure 5: Dry river bed near Vicam, Rio Yaqui (2015). Image by Anabel Galindo.



Figure 6: Dry river bed near Torim, Rio Yaqui (2005). Image by Anabel Galindo.



Figures 8 and 9: Scenes near Vicam, Rio Yaqui. In early September 2010, the floodgates to the Novillo Dam (Sonora) were opened due to an overflow, which allowed the Hiak Vatwe to flow into the dry river course. The resulting landscape sparked the imagination and conversations about what the flow of the Hiak Vatwe must have looked like prior to the construction of the three dams. Photos by Anabel Galindo.

Indigenous rights over their traditional cultural landscape. Continuous demands for solutions have pressed Mexico to reevaluate its role and the rights of Indigenous peoples. In 2001, Article 2 of the Constitution conveyed broad and aspirational recognition with respect to Indigenous rights. However, it omitted reference to the issue of pre-existing claims to resource tenure. These amendments, therefore, have yet to address the fundamental concerns that affect Indigenous peoples and it is uncertain how the new laws will deal with globalizing changes and technology

that capitalize on environmental destruction and the alienation of Indigenous peoples to their cultural landscape, as in the *Hiak Vatwe* case. Nevertheless, a century after a transformative agricultural agenda, Yaqui Indigenous communities fervently continue to pressure the government for change, to uphold the rights they already have, and to seek solutions that will enable Yaqui people to make autonomous decisions that aim, at the core, to protect and preserve the *Hiak Vatwe* landscape.

Footnotes

[1] The *Hiak Vatwe* flows 850 km starting from the Sierra Madre Occidental in the state of Sonora and ends at the Gulf of California. It is considered one of the most important river systems in Northwest Mexico.

Landscape is used here to describe the natural resources of a given place or territoriality (in this case Rio Yaqui Territory that encompasses roughly 485,000 hectares of ancestral land). The term “landscape” is also used to understand a relationship between its Indigenous inhabitants and the physical space tied by the historical cultural connections. To use historian Richard White’s words, “We cannot understand human history without natural history and vice versa” (White, 1995: iv). To understand how humans shaped the changes in a given land base, I refer to Steven Bourassa (1991) and Denis Cosgrove (1984) for their theoretical framework to understand the landscape.

[2] For further reading, see Alfred Crosby’s *Columbian Exchange: Biological and Cultural Consequences of 1492* (1972); Elinor Melville, *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (1994); Emily Brownell and Toyin Falola, *Landscapes, Environments, and Technology in Colonial and Postcolonial Africa* (2012); Rebecca Earle, *The Body of the Conquistador: Food, Race and the Colonial Experience in Spanish America 1492-1700* (2012).

[3] Jesuit priests noted the magnitude of the *Hiak Vatwe*’s fertile soil: Yaquis had abundant harvests of squash, beans, and corn, relying mostly on river floods.

[4] The independence movement began in 1810, but Mexico did not achieve independence until 1821. See Josefina Zoraida Vasquez and Lorenzo Meyer, *The United States and Mexico* (1995), for further discussion on the war of 1846–48, and Pedro Santoni, *Mexico at Arms: Puro Federalists and the Politics of War, 1845–1848* (1996).

[5] Yaquis were often working for landowners that controlled areas once belonging to ancestral lands. This is not only a Yaqui experience; many native peoples were forced legally off their lands, but yet employed by the families who usurped ownership. In many rural villages, Indigenous communities were forced to migrate to the capital city for an opportunity that the countryside could no longer afford them. See Lourdes Arizpe.

[6] American leisure magazines, like *Sunset*, *Overland*, *Munsley*, and *Pacific Monthly*, among others, reported on the Yaqui Wars and described the horrors of war, but also the inevitable decimation of a nation. As a solution to the Yaqui Wars, and to rid the valley of the traditional knowledge bearers, state and federal officials deported the Yaquis to Yucatan, Oaxaca, and other states in Mexico.

[7] Historian Alan Knight extensively analyzed the factors that ignited the revolution, arguing that those directly affected by the land changes, villagers dispossessed of their lands, as the Zapatistas, and most importantly in the north by the *serranos* and *rancheros*, all those were threatened by the expansion of the hacienda.

[8] By the 1920s, the traditional villages of Bacum and Cocorit were lost to non-Yaqui farmers who had encroached during the wars. The traditional villages have since been relocated.

[9] Renting land parcels, although illegal, became a source of income for Yaqui farmers who, as a result of the modification of Article 27 in 1992, which allowed for the privatization of the *ejido* collectives, left Indigenous communities unable to access credit lines, as they no longer had collateral nor support from the state. Renting became a widespread practice by the early 2000s, when almost 96% of Yaqui farming land in the *Hiak Vatwe* was rented to non-Yaquis who had the means to invest.

[10] Meza, Maria Mercedes. "Plaguicidas Organoclorados en Niños Indígenas de Potam, Sonora, México." Presentation at the Binational Forum: Law and Environment on the Yaqui River Hermosillo, Sonora, August 18, 2017.

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About the Authors

Anabel Galindo is a doctoral student whose research centers on a long duree of Yaqui history, exploring concepts of mobility, community, and identity from the mid-eighteenth century to modern twentieth century. Ms. Galindo has committed herself both at an academic and personal level to the Yaqui communities on both sides of the border. She is part of the history team at the Department of Language and Culture at the Pascua Yaqui Tribe and has helped develop resources and courses that raise awareness, in a binational effort, of the historical processes that have shaped Yaqui histories. Her dedication is vested in the community, her family, and her studies.

James Hopkins is Associate Clinical Professor in the Indigenous Peoples Law and Policy Program, James E. Rogers College of Law, University of Arizona. His work has been instrumental in the development of the Human Rights Commission case for the Rio Yaqui communities. Currently he is in partnership with the Pascua Yaqui Tribe, U.S. Fish and Wildlife, and the University of Sonora, Mexico, and together with his students they are actively engaged on a unique recovery project to establish sustainable aquaculture for the Yaqui catfish and other indigenous freshwater fish species in the Rio Yaqui basin.