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# Plantation Pasts, Plantation Futures: Resisting Zombie Water Infrastructures in Maui, Hawai'i

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# Plantation Pasts, Plantation Futures: Resisting Zombie Water Infrastructures in Maui, Hawai'i

## Abstract

Sugar plantations have fundamentally shaped water use in Maui, Hawai'i for over 100 years, with tremendous resulting impacts on ecosystems and Native Hawaiian communities. In this paper, we build on literature on the plantationocene and the political lives of infrastructure to examine plantation irrigation infrastructure. We center Maui's vast water conveyance ditch system as a means of understanding how infrastructure continues plantation logics into the present, considering both the physical ditches themselves as well as the laws and politics which support continued water extraction. We also consider infrastructural futures, highlighting ongoing efforts of communities seeking water justice via infrastructural control.

**Keywords:** Plantation, Native Hawaiian, water rights, infrastructure, *wai*

## Introduction

*I think that the State of Hawaii has allowed a great injustice to be inflicted on our Native Hawaiian people tantamount to genocide. And I used that word not lightly, to me, genocide is when you kill off a people, when you deprive them of their ability to be who they are, a people, a kanaka...They cannot be who they are because they are deprived of the resources to continue their traditional lifestyle. This is very, very serious, our community is very angry, if you don't need scientific studies just go look and see what's in the water, there's nothing there. There's nothing in the streams. They look like barren dry rock beds. You can see with your own eyes. It's common sense. Put the water back, let our farmers, you know, continue their traditional lifestyle and also their gathering.*

(Mahealani Perez-Wendt, Transcript of Oral Testimony, Public Fact Gathering Meeting, Haiku Community Center, Haiku, Maui, April 10, 2008)<sup>1</sup>

For over 25 years, the Native Hawaiian taro (*kalo*) farmers of East Maui fought countless court battles against East Maui Irrigation (EMI) and their parent company, Alexander & Baldwin (A&B). Alexander & Baldwin, one of the "big five" sugar companies that aided in the colonization and overthrow of the Hawaiian kingdom, closed the last remaining sugar plantation in Hawai'i in late 2016, when they stopped farming on 41,000 acres in the Central Valley of the island of Maui. Irrigating the Central Valley plantation for nearly 150 years required the use of large volumes of water. To secure this water, A&B, under the umbrella of East Maui Irrigation, constructed a vast system of water conveyance ditches and storage reservoirs, dewatering the East Maui streams that had nourished the taro patches of Native Hawaiians for generations. Through the large-scale movement of water, sugar production effectively "remolded the islands into a production machine that drew extensively on island

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<sup>1</sup> <https://files.hawaii.gov/dlnr/cwrm/activity/iifsmaui1/PR200807.pdf> (page 1.0-4)

soils, forests, waters, and its island residents, to satisfy North America's sugar craving" (MacLennan 2014: 3).

The closure of the sugar plantation dovetailed with several hard-fought legal victories by taro farmers, resulting in the mandate that diversions on many streams be minimized so mountaintop to sea (*mauka* to *makai*) streamflow could be restored. Shortly after the announcement of the planned closure of the plantation, a local paper, *Maui Time*, wrote a retrospective on sugar production, in which local politicians, industry players, activists, and others expressed sadness at the end of an era, or asserted that the turning of this page in Hawai'i's history left openings for more ecologically- and socially-just uses of land and water. However, one of those quoted in the piece, Carol MacLennan, an anthropologist and scholar of Hawaiian sugar production, expressed a different viewpoint, noting that she believes that plantation sugar will continue to exist on the island, albeit in what she described as "a ghost form" (Pignataro 2016).

In this paper, we argue that understanding the future of Maui requires close attention to its past. Drawing on the literature from geography, anthropology, and adjacent disciplines on the plantationocene and the political lives of infrastructure, we center Maui's expansive water conveyance ditch system as a means of understanding how infrastructure continues plantation logics into the present. We conceptualize the ditch infrastructure as including both its material and physical form, as well as the laws and politics which continually (re)legitimate its character as socially necessary and privately-owned. This infrastructure—which captures water that Native Hawaiians require for social and cultural reproduction and converts it into a cheap input for agricultural production—is currently making it possible for new, ostensibly post-plantation, owners to shift the Central Valley's agricultural production away from sugar cane, while benefiting from durable plantation-era hydro-social and socio-ecological relations. In this sense, the ditches can be understood as an example of what Sizek has described as "zombie infrastructure," or "the reanimation of both legal and material substrates... to reveal how contemporary capitalist projects depend on repurposing older forms of capitalist investment and, in so doing, resurface histories of dispossession of labor and land" (2021, 759).

In this sense, returning to MacLennan's comment above, we argue that the continuation of large-scale agriculture in the Central Valley, fueled by the massive movement of East Maui water through the ditches and legitimized through leases, could very well be the "ghost" form that she predicted sugar would take. The ditches, built by exploited immigrant labor and which disrupted generations of Native Hawaiian livelihoods, are currently taking on a new form as a source of cheap water for institutional and international farmland investors. As such, they provide an example of what Katherine McKittrick has described, in the context of slavery and

US urban centers, as “plantation futures” (2013). McKittrick’s understanding is premised on an understanding of space-time that collapses the past and present to highlight the ways that the historic injustice of the plantation enacts violence in the present and future. Through our focus on infrastructure, we highlight the ways that durable social relations and materiality play a role in collapsing the distinction between past and present; through the ditch system, the present and future is deeply conditioned by the past, as the movement of water has remade the island in the image of the sugar plantation in ways that make it difficult to move beyond, even after sugar production has ceased.

After reviewing our research methods, we review literature on the plantationocene, as well as literature on colonial and water infrastructure. Next, we describe the transformation of the Hawaiian Islands by sugar and other large agricultural players, and detail the history and present state of the EMI ditch system. We then discuss the longevity of the ditch infrastructure and attendant socio-ecological relations, beginning with the material infrastructure and then layering on the political and legal means by which East Maui stream water has been construed as the transportable property of A&B/EMI. Finally, we consider infrastructural futures, recognizing that while the infrastructure is very durable, it is not totalizing or determinist, and highlight some recent examples of communities and political actors pushing back on the plantation past and present in the service of more just futures.

## **Methods**

This research is based on fieldwork conducted between January 2017 and June 2022. We draw on four sources of data: semi-structured interviews; site visits and participant observation; corporate and government documents; and public hearings. Semi-structured interviews were conducted primarily in person during five visits to Maui and one visit to O’ahu. While we interviewed some people more than once, in total we spoke to 56 unique people with a range of positionalities. Interviews ranged on average from 1-2 hours and were either audio recorded and transcribed or captured in extensive notes, depending on interviewee preference. Secondly, we gained information about water infrastructure and traditional and customary Hawaiian practices through site visits with informants to *lo’i* (taro patches) and irrigation ditches. Third, we conducted a thorough review of relevant government, legal, and corporate documents, including draft and final Environmental Impact Statements (EIS) and associated public comments and responses, contested case hearings and exhibits (including testimonies, closing arguments, maps, and images), and Securities and Exchange Commission (SEC) filings. Lastly, we attended virtually or watched recordings of Maui County Council meetings from 2021 and 2022. Interview transcripts, documents, images, and hearings were coded for relevant themes.

As white non-Hawaiian North Americans, we have aimed to be reflexive about our positions as outsiders. Throughout the research process, we have tried to select research methods that allow informants to speak for themselves and to reflect various informants' positions accurately and, often, in their own words. We also recognize that many of the concepts that we are drawing on in this work come from Native scholars, scholars of color, and Native Hawaiian community activists, and we appreciate the fact that these are not merely scholarly ideas, but reflections of lived experiences that are different from our own.

## **Literature Review**

### *Hawai'i and the Plantationocene*

With the explosive growth of sugar production on the Hawaiian Islands, diverse and abundant landscapes, organized around the socio-economic, climatic, and ecological land divisions called *ahupua'a* were fundamentally disrupted, as land, labor, and water were diverted in service of plantation agriculture (Beamer 2014, MacLennan 2014, Fujikane 2021). While the Hawaiian experience of plantation agriculture had different trajectories and temporalities from those of the Americas, the hallmarks of plantation capitalism were similar across contexts: the remaking of local landscapes and ecologies around the singular goal of producing monocrops for export, heavy reliance on a foreign and racialized indentured/enslaved labor force (Burnard and Garrigus 2016), the transformation of human and more-than-human relationships (Chao 2022, Haraway 2015), and the remaking—through new spatio-temporalities and the concentration of water and other resources—of formerly independent places into “plantation towns” (Purifoy 2021, McKittrick 2013).

While there has been a longstanding academic interest in sugar and other plantation economies (e.g. Mintz 1985), there has been a renewed interest in recent years in what scholars have termed “the plantationocene” (Haraway 2015, Davis et al. 2019, Chao 2022, Wolford 2021). This is due in part to the explosive growth of modern-day plantation agriculture around the globe (Li 2018), as well as a growing body of work in Black geographies and adjacent fields on the socio-spatial legacies of slavery and racialized violence (Bledsoe et al. 2017, Wright 2019). Much of this work, particularly that from the environmental humanities (e.g. Haraway 2015), responds to the concept of the anthropocene and human impacts on the climate and geology of the earth, arguing for the plantation era as the critical moment where the global movement of humans and species and large-scale transition to export-oriented monocrop agriculture irrevocably shifted nature/society relations on a planetary scale (Mittman 2019). By focusing on the plantation as “the synthesis of field and factory” (Mintz 1985), this scholarship points to the key role of the plantation in the origins of industrial capitalism, as well as the fact that “environmental problems cannot be decoupled from histories of colonialism, capitalism, and racism that have made some human beings more vulnerable than others to warming

temperatures, rising seas, toxic exposures, and land dispossession occurring across the globe” (Moore et al. 2019).

Recently, there have been several key expansions and critiques of the plantationocene framing. Davis et al. (2019) have raised the fact that race and chattel slavery are two key elements of plantation economies, and that they should be foregrounded in scholarly conceptualizations of the plantationocene. As Wolford (2021) puts it, “Davis et al. (2019) argued that the environmental humanities approach has to date sidelined the core issue of race, emphasizing ecological disruption rather than focusing on the violence of enslavement and the construction of a new, race-based world order” (1623). Davis et al. put forth the concept of “the plot,” adapted from Jamaican scholar Sylvia Wynter, as a space both within and beyond the plantation from which to grow food and build oppositional ways of life. Carney (2020), like Davis et al. (2019), is also concerned with resistance and autonomy amongst enslaved plantation workers. Both focus on the autonomy of enslaved peoples to resist the totalizing nature of the plantation by growing culturally meaningful foods in garden plots beyond the edges of the monocultures. Their work on the garden plot has many resonances with the Native Hawaiian *lo’i*, a critical space for practicing culture and religion and providing sustenance outside of the bounds of the settler-colonial capitalist system (Goodyear-Kaopua et al. 2014, McGregor 2007).

The enduring nature of plantation socio-ecological relations and racialized violence are a critical topic of this literature. As Katherine McKittrick’s concept of “plantation futures” underscores, there is a clear throughline from the racialized violence, socio-spatial exclusion, and remaking of environments and property relations that come with the plantation to the present day. Similarly, Levi Van Sant shows the endurance of the plantation and its racial hierarchies through historical and ongoing efforts to retain and consolidate white landownership in the postbellum US South (2016). Within Hawai’i, the persistence of the plantation can be seen in Hawaiian law and politics (Cooper and Daws 1990), where plantation sugar and pineapple companies have long held an outsized role in governance. The legacies of plantation agriculture are also apparent in Hawai’i’s multi-ethnic society (Beechert 1985; Fujikane & Okamura 2008)--a product, at least in part, of the 1850 Hawai’i Masters and Servants Act which brought in Chinese and Japanese plantation laborers as indentured servants (Sur 2008). The historic power of plantation owners in the Hawaiian Kingdom is also visible in the hybrid Native Hawaiian/Western approaches to water and property law that were ushered in with the Great Māhele (Beamer 2014). With this paper, we focus on one of the most enduring plantation legacies on the Hawaiian Islands and on Maui specifically: water conveyance infrastructure.

*Infrastructure and its Afterlives*

Drawing from science and technology studies (STS) and other critical scholarship, geographers and anthropologists have conceptualized infrastructure as networked assemblages with social, political, legal, technological and material/physical aspects (Larkin 2013). Infrastructures take on a variety of physical forms to facilitate circulation of water, energy, people, ideas, and so on, but also represent particular political goals. Critical social scientists have extensively examined the politics and power embedded in infrastructural objects such as dams, pipelines, roads, and railways (Anand, Gupta & Appel 2018), the legal and governance processes that facilitate infrastructural development (Valverde 2022), and the relationships between human-designed infrastructure and nonhuman environments and landscapes that may destabilize or challenge infrastructural goals (e.g., Carse 2014; Ballesteros 2015; Barry 2020). Infrastructure can be viewed as epitomizing modernity and development; yet infrastructure is also differentially deployed or withheld to implement biopolitical priorities, bolstering some communities and populations while undermining others (Anand, Gupta & Appel 2018).

Many modern forms of dispossession and exploitation have their roots in networks of colonial infrastructure (See e.g., Barney, 2021; Crosby, 2021; Curley, 2021). The slave trade and the plantation, in particular, were key nodes in a geography of economic dependency that moved people and goods between empire and colony (Chua et al., 2018). These infrastructural networks reoriented and rescaled social relations toward colonial subjectivity and export production; and they “entrench[ed] and harden[ed]” the logics of uneven development into tangible forms (LaDuke and Cowen, 2020: 244). Infrastructure, as built environment, also brought about widespread and fundamental landscape change in colonial societies (Dang, 2021). Canada’s national railway, for example, was used to dispossess Indigenous peoples of their land, facilitate resource extraction for export, link the United Kingdom to Asia, and create the Canadian confederation (Barney, 2021; Cowen, 2020).

The ports, pipelines, dams, diversion ditches, roads and railroads established under colonialism continue to reinforce inequalities of wealth and racialized divisions of labor (Davies, 2021; LaDuke and Cowen, 2020). As a result, the “colonial order of things” can persist in postcolonial societies through “imperial debris,” the material remnants of conquest and subjugation (Stoler, 2008: 193). These afterlives of colonial infrastructure can take many forms, from infrastructure that continues to function as intended (Rizvi, 2019) to relics and ruins: failing bridges, leaking pipes, abandoned buildings (McAtackney and Palmer, 2016; Stoler, 2008). Sizek (2021) proposes a third category, the “livingdead” infrastructure that comes back to life, reanimated by new capital. This “zombie infrastructure” underscores the changeable nature of much infrastructure that is continually degrading and being remade (Sizek, 2021). Infrastructure has also been repurposed in activist struggles where transportation networks shift from tools of

domination to resistance. Blockades targeting fossil fuel projects, for example, underscore the possibility for transforming colonial infrastructure (Cowen, 2020).

### *Irrigation Infrastructure, Colonialism, and the Remaking of Environments*

Water infrastructure represents a notable component of colonial projects of dispossession and resource exploitation, and given that a large share of water resources worldwide are diverted to support irrigated monocrop and plantation agriculture, irrigation infrastructure has been a particularly significant tool of dispossession. Curley (2021), for example, describes water infrastructure as an essential part of the workings of colonialism, pointing to water diversion projects and dams as key types of infrastructure that have remade landscapes and dispossessed Indigenous people. Likewise, Berry and Jackson (2018) describe irrigation infrastructure as inextricably intertwined with settler colonial logic and racialization processes, shaping ideas of whiteness while dispossessing Indigenous communities and marginalizing other communities of color.

There is a long history of discussing relationships between irrigation and political structures and systems (Obertreis et al 2016). For example, although Wittfogel's 1957 "hydraulic societies" hypothesis, which argued that large-scale irrigation systems are causally linked to autocratic political leadership, has been critiqued, the idea of 'modern hydraulic societies,' in which control of water is inextricably linked to political power has been taken up by many scholars since (e.g., Worster 1992; Scoville 2019). Theoretical framings such as the 'hydrosocial cycle' point to the interrelationships between water, infrastructure, and social and political power (Linton & Budds 2014). This work has provided a useful jumping-off point for those investigating colonial impacts on water flows and relationships (Wilson 2014; Jackson & Head 2020; Kelly 2021; Berry & Cavazos Cohn 2022). Water infrastructure has been conceptualized as the materialization of hydrosocial imaginaries, norms, and values (Hommes, Hoogesteger & Boelens et al 2022).

Irrigation infrastructure consists of a wide mix of technologies at different scales, including large dams and reservoirs, smaller diversion systems, groundwater pumping systems, and canals, pipes, and diversion ditches, all of which share a goal of diverting and conveying water for irrigation purposes. While highly visible projects such as hydropower dams are often in the spotlight of political ecology analysis (Kaika 2006; Kelly 2021), lesser-known and lower-profile irrigation infrastructure can be equally influential in remaking landscapes and transforming hydrosocial territories and relationships. Irrigation infrastructure in Hawai'i, which includes extremely extensive diversion and conveyance systems, is not as well-known as the tall hydropower dams of the Western Continental United States, yet as Berry (2014) has described, it has been a crucial component of completely remaking socio-environmental systems away



from traditional Hawaiian systems and toward the monocrop, export-oriented plantation. Another notable component of Hawai'i's irrigation system is that it was privately developed by the sugar companies, making it fully a product of the plantation, whereas in comparison, other extensive irrigation infrastructure systems such as that of the Western US were federally subsidized through the Bureau of Reclamation (Ward 2010).

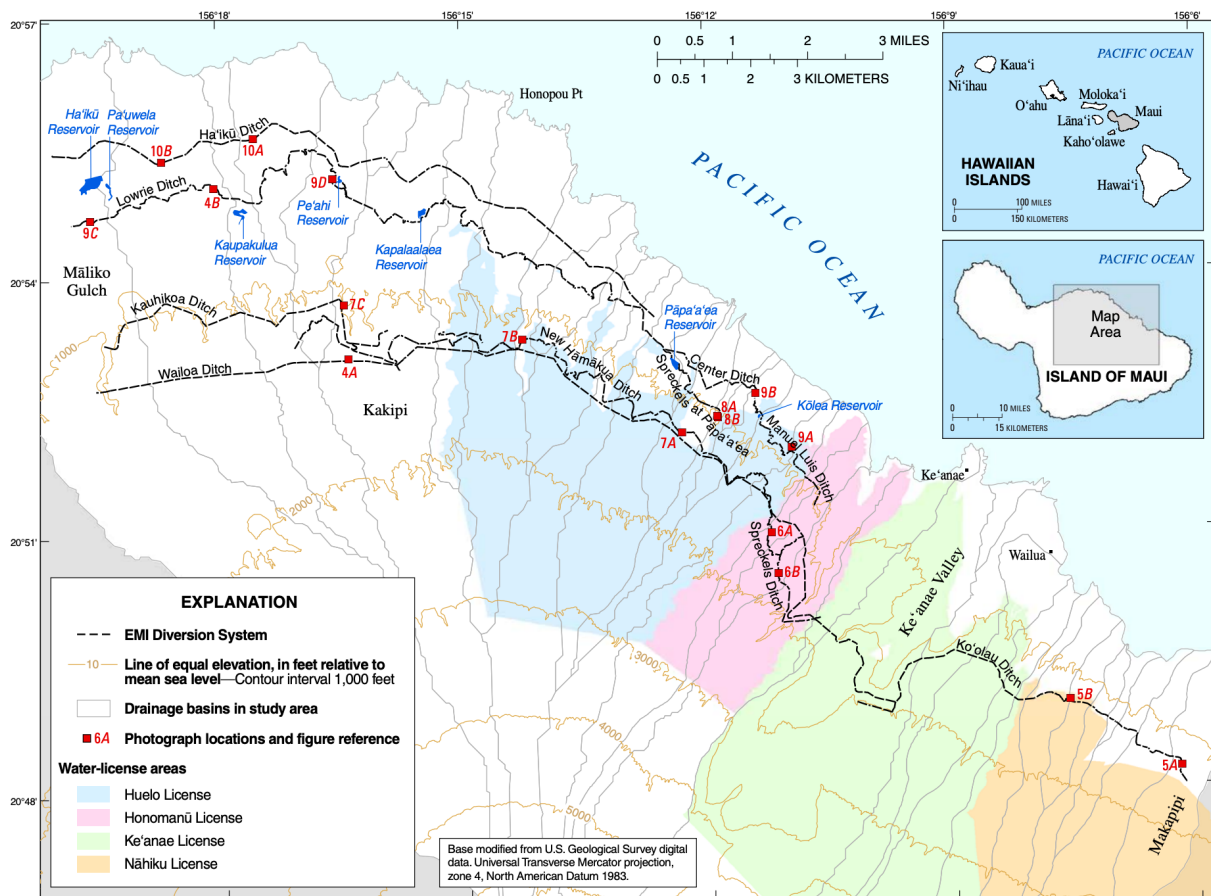
### **Constructing the Ditch, Remaking the Island**

Before contact with Europeans and Americans, the Hawaiian land tenure system was based on common ownership of resources. The maka'āinana (commoners) had the right to hunt, fish, gather plants, and use water to cultivate taro (MacKenzie, 2015). Water and taro have deep connections to Native Hawaiians: water is the embodiment of the god Kāne, and taro is the elder brother of the first Hawaiian (Fisher, 2015). With Captain Cook's arrival in 1778, and Hawai'i's subsequent entry into world markets for sandalwood, whaling, and then large-scale agriculture, the islands radically changed (McGregor, 2007). Largely from introduced diseases and the social dislocations of the sandalwood trade, the Native Hawaiian population fell from an estimated 800,000 people in the late 17th century to 107,954 in 1836 (Beamer, 2014). At the same time, foreigners pressed for secure land tenure as they invested more capital in sugar plantations (MacKenzie, 2015). By the mid-nineteenth century the Hawaiian monarchy actively supported the sugar industry, seeing it as a lucrative export crop that would attract investment (Wilcox, 1997).

In 1848, in an act known as the Great Māhele, the Kingdom of Hawai'i began dividing land between the king, the chiefs and the maka'āinana in an effort to sustain traditional land management while also allowing for the ownership of land (Beamer, 2014). Plantation agriculture increased substantially in the following decades, with three-fourths of privately owned land across Hawai'i – totaling millions of acres – belonging to a small number of foreigners. This was facilitated in part by chiefs who sold large parcels of land to Westerners in order to pay off debts incurred by buying imported goods (MacKenzie, 2015). Western sugar interests also claimed appurtenant (attached) water rights on their purchased land (Sproat, 2015). These water rights allowed landowners to transport water through ditches from wet areas of the islands to their dry plantations. Following struggles over a treaty to ensure tariff-free entry of Hawaiian sugar to the United States market, powerful plantation owners overthrew the Hawaiian Monarchy in 1893 (MacKenzie, 2015). Coupled with growing plantation infrastructure, this led to an extraordinary growth in sugar exports, from 260 million pounds in 1890 to over 2 billion pounds in 1932 (Wilcox, 1997).

East Maui's vast water conveyance system began in 1876, when the Kingdom of Hawai'i granted the Hamakua Ditch Company – EMI's predecessor, and a partnership of A&B and four

other plantations – a 20-year lease to “take, draw off and use the water” of East Maui streams (Hawaiian Government 1876, p. 1). In 1898, A&B acquired a controlling interest in the rival Hawaiian Commercial and Sugar Company (HC&S), adding their ditch system and 30-year water rights lease to A&B’s growing infrastructure (Witcher 2016). Within 25 years, the renamed East Maui Irrigation Company (EMI) had completed its system, becoming the United States’ largest private water company with 24 miles of ditches, 50 miles of tunnels, and a collection of dams, pipes, siphons, and flumes that draws from a watershed of approximately 50,000 acres (33,000 acres of which are owned by the State of Hawai‘i) (Wilcox 1997; Final EIS) (Fig. 1). By crossing streams at varying elevations, EMI’s ditch system has historically diverted 445 million gallons of water every day, capturing not only the base flow of almost all diverted streams, but also the groundwater that feeds gaining streams as they flow toward the ocean (CWRM 2018, p. iii).



**Figure 1:** East Maui Irrigation Map of the Ditch System and Property Ownership in the East Maui Four License Areas. Source: US Geological Survey, 2012.

After the first water leases were renewed in the early twentieth century, a 1938 agreement with the Territory of Hawai‘i again gave EMI the exclusive right to draw water from East Maui

streams. In addition, the agreement granted both EMI and the Territory perpetual easements for the parts of the ditch system that lay on the other's land (Territory of Hawaii 1938). The right to collect water in the four license areas were established through 21-year leases held at public auction. For all four licenses, EMI was the only bidder, underscoring that the leases were effectively only usable by EMI. This was both because the 1938 agreement gave EMI exclusive easements to convey water through government land – a right not available to other licensees – and because the “...price [of the water] is dependent on the price of sugar, indicating the fact that the water is to be used by the sugar industry” (Maui County Water Department 1961, p. 2). These leases persisted until 1986, when, as a result of challenges by Native Hawaiians that questioned the legitimacy of granting plantations long-term water rights, EMI began to receive one-year revocable permits instead (Ho'okano 2014).

Maui's growing sugar plantations were founded on land privatized by the Great Māhele, irrigated by lease-regulated water, and built by immigrant laborers controlled by the 1852 Masters and Servants Act (Wianecki 2016). This indentured labor system was a response to the sugar industry's inability to hire Native Hawaiians away from their own farms, a dynamic similar to earlier Atlantic colonies, where indigeneous peoples also suffered great population loss and shunned plantation work (Beechert 1985). Indentured labor was also a way of competing with Cuba and Brazil, the era's major sugar producing countries that still used slave labor (Sur 2008). Although unfree labor contradicted Hawai'i's Constitution that prohibited involuntary servitude, the Territory's courts were willing to tolerate the imprisonment at hard labor of those refusing to work, the physical abuse of workers, and their sale from one plantation to another (Sur 2008). Plantation labor, including ditch construction, was exhausting work performed under harsh conditions. Building the ten-mile long Ko'olau Ditch in 1904-1905, for example, required Japanese immigrants to dig out 38 tunnels from solid rock using hand drills (Witcher 2016). Most immigrant laborers came first from China, then Japan, with these groups growing from 4.5% to 56.5% of Hawai'i's total population between 1852 and 1896 (Sur 2008). Non-white immigrants were subject to racial discrimination, lacking the right to vote – even as naturalized citizens – that was granted to non-citizen laborers from Portugal or Puerto Rico (Sur 2008).

From the first water lease in 1876, sugar companies were prohibited from “injuriously” affecting the existing rights of people in East Maui (Hawaiian Government 1876, p. 3). At the same time, though, industry and government on Maui had little regard for Native Hawaiian water needs. It was a common claim that there was “at best but a very sparse population in that region [of East Maui] and the waters from time immemorial run waste into the sea,” in the words of Attorney General Castle in a letter supporting Castle & Cooke's request<sup>2</sup> that the 1876

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<sup>2</sup> In a sign of the interlinkages between the sugar industry and the government, Attorney General Cooke's father co-founded Castle & Cooke, a major investor in Maui sugar plantations.

agreement be approved (Castle 1876, in Maly, 2001a, p. 450). However, this was false. For centuries before EMI's ditch system, the hundreds of streams of East Maui supported the cultivation of taro and other culturally important crops, as well as being home to the endemic species of hīhīwai (snail), 'o'opu (goby) and 'opae (shrimp). According to Kepa Maly, who, in 2001, conducted oral history interviews in East Maui, largely with Native Hawaiians born in the 1910s or 1920s, "water used to flow mauka-makai in all of the streams... 50 and more years ago. This is not the case today" (Maly, 2001, vol. 2., p. 9). In Maly's interview with Helen Akiona Nākānelua, born in 1911, she compared the currently dry streams with those of her youth, saying "The only time we have the water is when big water and then they throw it out. Otherwise there's hardly any water... we want every kahawai [stream] get water like before. Never dry, never, never, never, never!" (Maly, 2001, Vol. 2, p. 289). Even through the 2000s, flow diminished, with streams that had previously fed *taro patches* running dry. "We planting taro in some horrific conditions," Steven Ho'okano of Wailuanui Valley told a local East Maui newspaper in 2008. "I've had big taro, small taro, rotten and diseased taro.<sup>3</sup> They all die from lack of water" (Ponushis 2008, p. 8). By dispossessing East Maui of its water, EMI caused great harm to people's livelihoods and cultural practices. For many Native Hawaiians who suffered for decades with this loss, sugar plantations and those abetting them in government are guilty of genocide (Interview, May 18, 2022). This was a repeated argument, for example, in a public fact gathering meeting in 2008, held by the Water Commission about restoring streamflow in East Maui (CWRM 2008, pp. 4, 8, 11, 14). As one community member argued, "Without appropriate water the decline of taro farmers will continue. Stream life will reach extinction and ultimately the genocide of the Hawaiian people and culture will result" (CWRM 2008, 11).

The year after EMI's last long-term water lease expired in 1986, East Maui residents and taro farmers, represented by the Native Hawaiian Legal Corporation (NHLC), challenged its renewal. Ten years later, Nā Moku Aupuni o Ko'olau Hui was formed to continue the ongoing struggle for water rights, to preserve taro farming knowledge and practices, and educate future generations (Ho'okano 2014). Through lengthy and expensive administrative hearings and court cases, EMI retained its diversions even as the sugar industry collapsed across Hawai'i. Only in 2018, two years after sugar production ceased in Maui, was water returned to 22 East Maui streams, with 10 fully restored for taro cultivation (CWRM 2018, pp. 268-269). But during this delay, a whole generation of Native Hawaiian elders who took up the fight in the 1980s had died. As one taro farmer told us, "It's a win but we don't get to enjoy it, our backs broken already" (Interview, May 18, 2022). After a century of water diversions, Native Hawaiians of East Maui are recovering from the knowledge loss of kūpuna (elder) practitioners, the missed farming

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<sup>3</sup> When streamflow diminishes too much, the underlying rocks warm the water, causing taro to rot, and killing aquatic life.

opportunities suffered by generations of youth, and the proliferation of invasive species and the degradation of lo'i and 'auwai (traditional irrigation ditches) (Perez Wendt 2018).

Plantation sugar declined across the Hawaiian Islands across the 1980s and 1990s as rising labor costs and the end of federal subsidies made its product uncompetitive in the global market. At the same time, plantation owners moved into more profitable businesses, including commercial real estate. One early real estate project for A&B was its planned community known as "Dream City," built in the decades after World War II as worker housing on the edge of its vast canefields in Maui's Central Valley (Maui Island Plan General Plan 2030, 2006, p. 8). Ultimately, A&B developed or sold parcels of land for tourist resorts and shopping centers, becoming a real estate investment trust (REIT) in 2017 (Interview, Sept. 11, 2018). In this way, A&B's trajectory followed other plantations around the world that moved from agricultural production to industrial and urban growth. By the time A&B completed its last sugar harvest at the end of 2016, it was Hawai'i's last sugar plantation.

In 2018, A&B found a new owner for the plantation and half of the EMI water conveyance system: Mahi Pono, a recently-formed partnership between California-based Pomona Farming—a subsidiary of the private equity firm Trinitas—and the Public Sector Pension Investment Board of Canada (PSP), who intend to convert the sugar plantation into diversified industrial agricultural production. Maui's Central Valley remains an attractive location for plantation agriculture: it is an enormous, contiguous piece of land, with its own roads and electrical system, and it has access to cheap water. The transaction included the possibility of Mahi Pono acquiring long-term leases for water at approximately 1/200th of the price that local small-scale farmers pay for water on the island. The centrality of cheap water is apparent in an unusual clause in the purchase agreement: if Mahi Pono is not able to secure these water lease rights within nine years, A&B is required to rebate Mahi Pono \$62 million of their \$267 million purchase price (Securities and Exchange Commission 2018). As a result, A&B has been actively drawing on its longstanding influence and control over island politics and state and county agencies to attempt to ensure that the leases can be secured. At the same time, county officials, taro farmers, and activists have been exploring a range of possibilities for local control of the system, arguing that private (and foreign) control of one of the island's major water systems could present challenges for Maui County's future in a changing climate. This is particularly concerning for Upcountry Maui, an area of the island that is historically a farming and ranching community, but increasingly growing as a population center. While exact quantities are highly disputed, this part of the county has some degree of dependence on the ditches for both household and agricultural water, given the high costs of pumping groundwater and the challenges of relying on groundwater into the future.

## **Legal and Material Infrastructures of the Ditch System**

In what follows, we focus on Maui's ditch system as a case study for understanding how infrastructure perpetuates the norms and logics of the plantation into the present, even after the plantation itself has closed. While we understand the material and legal/political aspects of infrastructure as inextricably co-produced, we consider these two dimensions separately below. Beginning from the literal ground up, we first discuss the physical ditches (material), then layer the social relations on top by examining the leases that enable collection and conveyance of the water (legal/political).

### ***Physical Infrastructure***

Maui's streams have a distinct verticality to them: since the island is composed of two volcanoes, the island's streams largely flow from mountaintop to sea. This verticality is reflected in the traditional subdivision of land, the *ahupua'a* system, which divided the island into pie shaped wedges that followed a *mauka* to *makai* patterning (for more on the *ahupua'a* system, see Winter et al. 2018). Native Hawaiians depend on this vertical flow of water to divert water through *'auwai*, traditional stream diversions that allow water to flood *lo'i kalo*, flowing through the patches to continue its downward path to the sea, where streams and seawater intermix, creating habitat for *o'opu* and *'opae*, among other species.





**Figure 2:** Haiku Ditch, near old cannery on Kokomo Road, East Maui. Photo by [authors].

In contrast, the EMI water conveyance system takes advantage of gravity while remaining largely horizontal. As Figure 1 demonstrates, the ditches cross-cut the streams, with many streams cut by multiple diversions at varying altitudes. One informant explained the morphology of the complex system to us, explaining that when a better ditch was built, the previous one would be partially abandoned, though parts would still be used. New ditches were also built higher up, so they could divert water at different levels, ensuring that more and more streamflow would be captured with each successive ditch constructed (Interview, May 17, 2017). Similarly, multiple informants remarked that in addition to building multiple horizontal ditches to capture streamflow, “the water system is made to catch every last drop” (Interview, May 18, 2022), and has been modified over time to include novel intakes and water capture methods to do so. This came up in a conversation between the authors and two informants who have long worked to restore streamflow:

*Informant 1: But it was really fascinating, I’ve gotta admit, to see that, when it was still actually being maintained. They were taking everything. Little rivulets of water with roof iron that’s*

*directing the water, collecting the water into this little pipe that runs down into another pipe, or another ditch...*

*Informant 2: A little PVC pipe, stuck into a little crack in...*

*Author: Just to, they had to get every little piece of it...*

*Informant 1: Everything!*

(Interview, August 10, 2018)

We heard stories from residents of East Maui about the variety of ways that the material system was being modified to capture every last drop, including via pipes, funnels or straws attached to vertical rock faces to capture water that dripped through them before it even reached streams, or cylindrical catchment basins that were designed to capture multiple waterfalls. In addition to these novel water intakes, the system also relies on the use of “development tunnels,” which were formed when engineers dug laterally across the streams to find basalt rock that was impervious to water. When water hits the basalt, it flows down into the tunnel. The water in the tunnel is then collected by a diversion ditch (Interview, January 13 2019). Gravity also plays a role in these tunnels: “the Lowrie runs at a considerably lower elevation than the Wailoa, taking advantage of groundwater development between the two” (Wilcox 1996, 121). Via the development tunnels, even if the system is not drawing directly from streams, it is still producing water which flows through the system. As one comment on the A&B/EMI Draft EIS (DEIS) notes: “development tunnels in the Lease Area will continue to produce millions of gallons of water every day that will enter the EMI Aqueduct System, even during droughts; it will also continue to flow with or without a Lease.” (Maui Tomorrow DEIS Comments, 2019, 3)

The system’s materiality and design mean that it operates continually unless one actively intervenes to prevent it from doing so. While the ditch system is the product of complex engineering, it is also remarkably simple. As one informant who is familiar with the EMI system explains: “the ditch works. Is it going to need some improvements down the line? Sure. But for the most part, it's all gravity...there are no pumps. There's nothing that operates this” (Interview, May 16 2022). Because the system is gravity fed, even though the newest major portions of the ditches are over 100 years old, the technology is simple enough to never become obsolete, and the system runs twenty-four hours a day, seven days a week, with minimal human intervention.



While the system's default is capturing and moving water, several recent lawsuits require streamflow to be restored to 22 East Maui streams, a process that has been exceedingly slow and complicated given the nature of the ditches. As one informant in East Maui explained, there are 65 diversions which need to be blocked, a process that has been slowed considerably by—ironically—environmental and other permitting processes. During our most recent visit, a helicopter was being used to block a single diversion, a fact that highlighted how challenging it will be to contend with the “hulking concrete structures” (Interview, May 18, 2022) of the EMI system. For the diversions that will need to be taken out of operation to ensure compliance with minimum streamflow standards, informants explained that most of the structures will be blocked off or filled with concrete, rendering them unfunctional, but still left in place, leaving open the possibility that they could be brought back on-line in the future if desired—another testament to the durability of the system.

While minimum instream flow standards mandate that some of the system be modified to reduce the total water capture, the gravity-fed and self-perpetuating nature of the system, coupled with Maui County's dependence on it, mean that it is unlikely that the ditches will be taken offline altogether. This is especially true given that Maui County has become dependent on the ditch system to deliver municipal water, particularly to residents in Maui's higher-elevation Upcountry region. While the exact figures are a major point of contention between the Mayor's office, EMI, the Maui County Board of Water Supply, and local activists (Interview, April 27 2022, TIG Report 2019), most parties agree that the persistence of the system as Maui County has grown up around it has meant that all water users, including the Maui County Department of Water Supply, are paying water rates that are artificially low. These low rates mean that most actors on the island are very conservative about disrupting the status quo, even though the status quo has dispossessed East Maui streams and communities for decades.

The ditch system has endured for over 100 years, ensnaring many parties into dependence on the ditches. Despite the relatively self-perpetuating gravity-fed nature of the ditches described above, many informants noted that the ditch system does require some maintenance. First, the ditches require some continued flow of water to ensure their functioning. As one informant who works in water management explains:

*much of these ditches are just earthen. So they need to stay wetted to some extent. A big part of ditch maintenance is vegetation. You get water, you get dirt, things grow. If you don't keep water in the ditch, things grow in the bottom of the ditch, and then it's almost impossible to restore it. You get roots that... I mean, generally a ditch functions because it's basically like a clay layer that keeps water in, there's low seepage loss. Once you get pukas [holes] in there, the loss goes up. (Interview, August 17, 2018)*

The system also requires extensive deferred maintenance, which could pose problems into the future. For example, reflecting on a report exploring the feasibility of the County taking over the ditches (TIG Report 2019), a member of county government speculates that the repairing the ditches would require large infusions of funding from off-island private investors or the federal government, and that it would take upwards of 20 years to fix the ditches. This person explains that:

*the current lease holder [EMI] has done NO work on it. It's in complete disrepair. In the Environmental Impact Statement, the current leaseholder has NO plans in there for upgrading the system, or they're very minimal, they've come back and said, 'oh, when we do the lease, we'll tell you what we're going to do,' but they have no incentive to repair it right now because they're water banking (Interview, May 19, 2022).*

As this informant implies, the disrepair actually presents certain positive externalities for the operators of the system. By moving water through a leaky system, the current owner is able to demonstrate higher demands for water because of the system losses—allowing them to establish higher baseline rates of water consumption that will be considered when issuing leases, even as Mahi Pono has planted crops on only a fraction of the Central Valley's former sugarcane land thus far (Interview, May 16 2022).

### ***Legal and Political Infrastructures***

Just as the material infrastructure instantiates path-dependencies that privilege the continuation of the plantation, political and legal infrastructure also serve to support water diversion for plantation production systems. This consists of, on the one hand, overt political power, and on the other, legal uncertainties and oversights that ultimately benefit the longtime users of the ditch system. While the bulk of this section will focus on the latter, it is necessary to acknowledge that A&B maintained favorable political conditions for themselves during the era of sugar production through campaign donations, placing employees in critical positions of power (such as the state-wide Commission on Water Resource Management), and through their role as a major employer on Maui. This overt involvement in politics helped them to secure favorable legislation and verdicts in courts at a range of scales for many decades (Interview, August 14 2018).

Beyond the direct involvement of A&B and their subsidiaries in politics, several enduring legal uncertainties have prolonged and legitimized the plantation ditches and stream diversions. The first among these are questions about the legitimacy of the chain of title and ownership of the ditch system itself. Given the fact that A&B and EMI negotiated agreements with multiple

iterations of governments over the course of Hawai'i's colonization and illegal annexation by the United States—including the Kingdom of Hawai'i, the Territory of Hawai'i, and the State of Hawai'i—there are open questions about which agreements remain valid and which do not. During 2019, for example, the Maui Board of Water Supply—historically a fairly apolitical advisory group to the water department—formed a Temporary Investigative Group to research options for the county to acquire the lease to the ditch system or purchase the EMI system. In this report, they review historical documents that indicate that the Kingdom of Hawai'i made only temporary agreements to use the ditches, with an expectation that the ditches dug as the precursor to the A&B system would eventually revert to the Kingdom. As one example, they cite a 1928 report from the Chief Engineer of EMI stating that the majority of the original leases had already expired and should have reverted to the Kingdom, per those agreements:

*Those portions of the new and old Hamakua Ditch, located upon Government land, reverted to the Government with the expiration of the Hamakua (1916) and Keanae (1925) Licenses respectively; and accordingly have been the property of the Government for some time. The Wailoa Ditch, which is located on the Spreckels Hamakua License, is still the property of East Maui Irrigation Co., but those parts which are on Government land will revert to the Government at the expiration of the Spreckels Hamakua License in 1938...*

(J.H. Foss [Chief Engineer, East Maui Irrigation Company], paper submitted to the Public Lands Commission, 1928; cited from TIG report 2019, p. 45).

At present, however, both the old and new Hamakua ditches and the Wailoa ditch are still understood to be the property of EMI. Similarly, a recurring theme across interviews, public testimonies, and comments on the Draft Environmental Impact Statement (DEIS) involved questioning establishment of ditch ownership via the 1938 agreement between the Territory of Hawai'i and A&B, described earlier in this paper. Several DEIS comments note that, even within a document of thousands of pages, little effort is made to establish ownership over such a contested system. The comments from a local environmental advocacy group, Maui Tomorrow, for example, believe this ownership is questionable, and ask that the revised EIS “identify the underlying ownership of every portion of every ditch and tunnel in the lease area, and provide evidence, such as chain of title from Kingdom days, showing how each parcel of land in the lease area, as well as in the central Maui agricultural area was legally acquired, and is now the property of A&B, EMI, and/or Mahi Pono” (Maui Tomorrow DEIS Comments, 2019, p. 5).

Per the 1938 agreement, EMI is entitled to convey water across state lands because of a perpetual easement based on the bidding on leases at a state-held auction. This raises a second major theme that emerged from the data, which we call the “the fiction of the leases.” This

phrase is drawn from an informant who has long been involved in water rights cases in East Maui, who described the leases and permits to the EMI system as a “legal fiction” (Interview June 3, 2022), noting that the system of leases and permits have long been used to maintain monopoly control over the physical infrastructure. This idea is premised on the fact that there has not been a long-term lease to the EMI system since the mid-1980s, and even when the leases had been up for public auction, the only bidder was EMI/A&B. As one example, the announcement of the 1950 lease to one of the four license areas (Ke’anae), describes the auction process as held at the “side door entrance” to a government office building, with EMI as “the only and highest bidder”:

*KNOW ALL MEN BY THESE PRESENTS:*

*That, the TERRITORY OF HAWAII, herein after called the “Licensor,” by its Commissioner of Public Lands acting under the authority in her vested pursuant to Section 73 of the Hawaiian Organic Act and the Revised Laws of Hawaii 1945, duly advertised and offered for sale at public auction held on November 15, 1950 at the Aupuni Street side door entrance to the Territorial Office Building at Wailuku, Maui, a land license to be known as “Keanae License”; and*

*That, at said auction sale, EAST MAUI IRRIGATION COMPANY, LIMITED, a Hawaiian Corporation, of Paia, Maui, herein after called the “Licensee,” was then and there the only and highest bidder, therefor (sic) having bid the sum of TEN DOLLARS (\$10.00) for the annual fee for said license.*

(Land License Bearing General Lease No. 3349, 1950, Exhibit C-08, from the contested case)

Since the last lease expired, A&B/EMI has maintained legal control over the system by switching off bidding on one- to three-year revocable permits. Since the same entity is not legally allowed to hold the permits twice in a row, the two companies would switch off bidding on and holding the revocable permits. While this seems like it could be inconvenient, this tactic has allowed the company to avoid, to some extent, having to comply with modern environmental and water management legislation, and has also ensured lower rental rates and property taxes:

*By alternating the name on the permits from year to year, one source close to the issue has recalled, A&B would benefit from having lower property taxes, since tenures of a year or less were granted more favorable taxes than those of longer duration. It was later determined that this same arrangement would work to get around the letter, if not the spirit, of the law limiting such permits to a maximum term of one year...Another element of the permits is that A&B is charged a fixed rate for the water, rather than paying a rate based on the volume of water taken. In addition, because the permits are short term, the state’s appraiser has discounted the*

*rental to be charged by 25 percent. Altogether, the state collects about \$160,000 a year on the four permits. (Environment Hawaii 1997)*

These low rates seem problematic for the state, but, as two attorneys who have long worked on Maui-related water issues explain, none of this would be possible without the political accommodation of the State of Hawai'i:

*Attorney 1: So what's so aggravating is that EMI, the subsidiary of HC&S, was acting like they owned the land, because they had these so-called temporary permits for two and a half decades. That's supposed to be year-to-year permits.*

*Attorney 2: What you begin to see is, what becomes very clear is that the government is providing...*

*Attorney 1: Accommodation.*

*Attorney 2: ...corporations with significant, what do you call it? Corporate welfare. Basically letting them do whatever they needed to do to make their costs as small as possible so they could make money for their shareholders.*

*(Interview, August 10, 2018)*

Similarly, during the closing arguments for a recent contested case hearing, an attorney for the Sierra Club pointed out that A&B and EMI's one-year revocable permits had been approved by the state's Bureau of Land and Natural Resources from 2001-2014 without even placing them on the agenda of their meetings, potentially a violation of the State of Hawai'i's guidelines for transparency in government agency meetings.

Political accommodation is apparent at the county level as well. Across interviews, there was a real sense that disrupting the flow of water through the ditches and into the Central Valley would reverberate across Maui society—potentially jeopardizing the access that Upcountry residents have to water, and raising rates on all residential and agricultural users—which led to a fear of abandoning the status-quo plantation era flows of water and control of the system by EMI. This specter of harming Upcountry gets wielded as a justification for extending the permits or granting leases. As one informant tells us, recounting a legislative hearing in Honolulu on a bill that was not passed, A&B and Maui County officials made this case:

*They're all saying, oh, upcountry people are not going to have water if we don't approve these leases for Mahi Pono. And so we have to do it or our people won't get water. And we're like, so*

*these guys are actually going to shut off water to upcountry? So first of all...the water comes from the sky. It's a gravity fed system. How are you going to stop the water, number one? But number two, even if you could, the governor is going to allow a private company to deny water to an entire part of Maui, like no way. (Interview, April 27, 2022)*

Aside from the politically expedient uncertainty created by the fiction of the leases, their content is also fictional to some degree as well. While the lease actually consists of permission to use four separate license areas with distinctive ecologies, populations, histories, and cultural values (Nāhiku, Ke'anae, Honomanū, and Huelo), the EIS and court cases frequently flatten these license areas into a single lease. Ke'anae, for example, is historically and currently a prime location for *lo'i kalo*, a protected traditional and customary practice for Native Hawaiians which depends on *mauka* to *makai* streamflow. As the following comment on the DEIS raises, it seems antithetical to the production of an EIS not to specify which streams will be diverted and how those diversions may harm human and more-than-human communities:

*One would think that one of the most essential terms to the Water Lease would be the amount of water proposed to be diverted and which specific areas those diversions would include. The DEIS discloses no proposed diversion amounts from individual stream sources and how those proposed amounts would impact the surrounding environment. The Water Lease should not be issued until all of the essential facts allowing for its implementation are revealed and subject to public opinion. Anything less would circumvent the very process of calling for an EIS. (Native Hawaiian Legal Corporation DEIS Comments, 2019, p 5)*

To sum, we found that the monopoly characteristic of the plantation remains in contemporary legal proceedings. During an interview, an informant who works in government implied that, while the lease will be going up for public auction, the only private bidder who could plausibly acquire them is EMI, because the lease is inextricably linked to the physical infrastructure:

*I would just say that I don't think there's any way that if you won the right to take the water, like—let's say, you won this. You somehow get the right to take the water away from EMI. How are you going to transport it? And I can't imagine building another system like that. Well, you know what? I'll just build my own system. It's all conservation land, forest reserve land now, plus the cost of doing so...I would say it is impossible to build something like that today. So I think, yeah, it's inextricably linked. You're know, if you're going to divert the water out of that area and send it across the island, that's the system you're going to use. (Interview, June 8, 2022)*

## **Infrastructural Futures?**

On July 18, 2022, Maui County Council voted to add a ballot measure for the upcoming election which would modify the County Charter to allow for the establishment of Maui County Community Water Authorities, beginning with an East Maui Regional Community Board. The proposal originated from an East Maui councilmember, and was widely supported by Native Hawaiians and local environmentalists, as a means of decentralizing control over water systems, and critically, as one possible way of having the community acquire the leases to the EMI system from the State of Hawai'i. On an island that primarily consists of a patchwork of privately-held water systems, nearly all of which are legacy systems from sugar or pineapple plantations, the ballot measure marks a radical departure. For the two months that the proposals were debated by the relevant sub-committees of the Maui County Council, each meeting on the topic ran overtime, largely due to extensive—and almost wholly supportive—public testimonies by members of communities that have long been impacted by water diversions.

While it remains to be seen whether the ballot measure will be successful, its emergence speaks to the fact that plantation power—while still undoubtedly strong—may be waning. While the ghost of sugar's past, and the “zombie infrastructure” of the ditch system continues to haunt the island, decades of hard-won legal battles by Native Hawaiians and environmentalists (Cantor et al. 2020) are beginning to change the calculus. This has meant tangible changes to both the material and legal infrastructure that have perpetuated plantation logics into the present. Materially, while the ditches remain, they will never see the same amount of water flowing through them again. One informant described this as moving into an “on demand” system: “sugar wasn't 'well, how much water do you need today?' It was get as much as you can and we'll figure out how we're going to use it. Versus now is: this is how much we need, okay, then that's how much we'll draw” (Interview, May 16, 2022). This on-demand system is required to respect and give preference to public trust uses of water, notably, Native Hawaiian traditional and customary practices (Sproat and Tuteur 2018, Cantor et al. 2020). Furthermore, as the State of Hawai'i moves forward with its plans to issue leases to the system for the first time in decades, doing so requires a complex appraisal process, which is no longer seen as just a process of assigning commodity value, but is required to take account of water's multiple social and cultural values:

*My understanding was for the older water leases, it was based on the price of sugar, there was some formula based on the price of sugar. So I don't think that's really relevant anymore. You know, and not to mention, aside from the economic question, I think our understanding of what water is as a public trust resource now is different from what it was, you know, 50 or 60 years ago... I think now there's more of a balance between, okay, yes, it's a commodity for the sake of*

*the lease, but it's also a very you know, it's a very significant public trust resource, so trying to thread the needle, so to speak (Interview, June 8 2022).*

This need to “thread the needle” means that, regardless of the outcome of the ballot measure, Mahi Pono will never be able to take as much water as the sugar plantations had, and will likely pay higher rates for water after the appraisal process has been completed. While the infrastructure stubbornly remains, portions of it have been taken out of commission, through materially filling ditches with concrete or welding metal plates over intakes, and through a process of legal “abandonment” for certain diversions and portions of the system, adding an extra layer of bureaucracy and expense for anyone who may want to “reanimate” these portions of the system in the future.

As diversions are closed up, and waterflow is restored on 22 East Maui streams, there is renewed hope for the future. While the older generation of taro farmers spent much of their adult lives fighting EMI/A&B in court for their water to be returned, their children and grandchildren get to see streamflow restored: “young people who don’t carry the same burden and memory... who just see all the fertile land, the water flows, the kupuna ready to teach them, and nothing but boundless possibility in ways that connect them to the past and the future and to feeding their communities” (Summer Sylva, NHLC, in Perez Wendt 2018). This shift has allowed younger members of organizations like Nā Moku Aupuni o Ko’olau Hui to be proactive rather than reactive. As one example, the group has been undertaking an extensive monitoring project of Ko’olau watershed with federal grant funding. While there are certainly reasons for activists and community members to stay vigilant—including the fact that the state Commission on Water Resource Management explicitly dictated in their decision that water be returned to East Maui without the ditch infrastructure being removed (Interview, July 13 2022)—there are also reasons to be hopeful about the future. While the ditch infrastructure is inflexible and durable—both legally and materially—and has played a critical role in instantiating the plantation present and future even as the physical sugar plantation itself has closed, there are clear signs that East Maui, and the Maui community writ large, is potentially open to challenging large agricultural interests in unprecedented ways.

## **Conclusion**

In this paper, we have considered the history of Maui’s water conveyance infrastructure, which cross-cut 33,000 acres of public land and has historically allowed for the dewatering of streams and disruption of Native Hawaiian livelihoods and traditional and customary practices like taro farming. As the system is undergoing a transition to a new owner, the durable social relations



and materiality of the ditches have played a role in collapsing the past and present, as the remaking of the island around plantation infrastructure makes it difficult to move beyond the plantation era, even after the closure of the sugar plantation. We make several contributions to the literature through our close engagement with the case study of Maui. First, we show the necessity of considering infrastructure—a durable, hybrid assemblage of material and political components—in the study of the enduring nature of plantations. Infrastructure is a key vehicle through which plantation logics are carried through into the present and future, and the study of plantation infrastructure warrants further study. In particular, we see infrastructure as a key component of the racialized violence of the plantation, as it comprises many of the physical and legal structures that facilitate exploitation and dispossession. Second, we have shown the “zombie” (Sizek 2021) nature of plantation infrastructure, which allows the plantation to persist even after its physical closure. Finally, we argue that while the plantation’s social relations and materiality are extremely durable, they are not determinist. As the victories of East Maui taro farmers in court and the recent proposal to establish community water authorities has shown, infrastructures—both legal and material—instantiate strong path dependencies and play a role in shaping potential futures, but they do not fully foreclose possibilities for more just water futures (Knudson et al. 2022). Working in the interstices, and through dedication and persistence, Maui’s native communities are working to return streamflow and recover species and taro despite the heavy burden of infrastructural legacies working against them.

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