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Parched Paradise: Building a Common Future Amid the Crisis of Modern Water in Mexico City

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Abstract
For more than a century, the *ejido* system, a historic water and land management system in rural areas of Mexico, has provided a spatial and social context for long-term, sustainable water distribution. The advent of public water distribution under the paradigm of so-called modern water has led the authorities of Mexico City to over-rely on a supply-side approach. As a result, the hydrological boundaries of the local and neighboring watersheds have been stretched to a dangerous degree. Furthermore, many residents experience limited access to clean water. Today we need to rethink the role of state, society and the environment to inspire future community practices in the urban context. This article proposes a location and design for a community building in an irregular neighborhood in the western hillslopes of Mexico City, which could function as a platform for collective action, inspired by *ejido* elements.

Policy Recommendations

- Establish the political framework for a decentralized water governance model and its protection from external actors. Allocate structural funding for this type of local management.
- Develop educational programs to raise awareness about the importance of water conservation and the benefits of community-led water management. Encourage the adoption of a "water culture" that promotes visibility and respect for water as a shared resource.
- Recognize and integrate the principles of traditional water management systems and technologies.

KEYWORDS

Ejidos
Mexico
Modern water
Water commons
Local governance

WATER VALUES

CLIMATE

Cwb: Subtropical highland climate

< Fig. 1 Inside view of a 118-inch HDPE pipe used in stormwater and sewer systems (Source: Tomas Castelazo, 2017. CC BY-SA 4.0, via Wikimedia Commons).

Introduction

In the twentieth century, the natural water system was systematically overexploited to sustain the expansion of Mexico City. Lakes and rivers were altered to meet the city's needs. What used to be an almost "paradisic" area, described by the American writer Brantz Mayer in 1847 as "filled with such variety of land and water" developed under Indigenous leadership, had eroded under colonial rule. Modernization efforts erased the remainder of the hydro-social equilibrium by transforming the conception of water from a shared resource into a strictly utilitarian one, spurring massive infrastructure projects like the Water Works, Lerma-Cutzamala System and the Deep-Drainage System.

Societal developments in modern Mexico have been fueled by what geographical philosopher Jamie Linton (2013) christened the "paradigm of modern water." The inherent contradiction of the "utilitarian" perspective of water birthed many social and environmental distortions. Water was abstracted from socio cultural contexts, becoming a universally exploitable resource. Specialized, technocratic water authorities were commissioned to consolidate power and expertise over the resource, creating the state-hydraulic paradigm (Bakker 2003).

In Mexico City, symptoms of the problem vary. Affluent residents shield themselves from most ailments while the poor suffer. The inherent power balance of the modern water system and widespread corruption (Eakin et al. 2016; Vitz 2018) have left those suffering the crisis without a platform for agency. This article first contrasts modern water's role in Mexico City and compares its (dis)functionality with the historic rural water management of the *ejidos*. It then advocates for translocating the *ejidos* to Mexico City, promoting communal water narratives and urban emancipation. The final section presents the author's design for a translocated *ejido* water complex in an irregular settlement of Mexico City.

The Mexican Commons

Under President Porfirio Díaz, Spanish settlers expropriated large swaths of Indigenously owned lands. The process led to strong rural discontent and fueled the Mexican Revolution in the 1910s. In response to revolutionary demands for land and liberty, the 1917 Constitution's Article 27 introduced the *ejidos*, a communal land management system inspired by the Aztec calpulli (Kourí 2015).

While the technical definition of *ejido* territory and its governmental structure are contested, "in terms of its performativity [...], *ejidos* are neither public nor private, but 'social property'" (Flores Hernandez 2020, 184). Central to its functionality is the Asemblea Ejidal (General Assembly), composed of all ejidatarios. Elections form the Ejidal Commissary and a surveillance council. The former coordinates the daily operations, organizes meetings and communal works, addresses conflicts and communicates with authorities. The latter intervenes in cases of Commissary misconduct. Ejidatarios also have the option to introduce Internal procedures and regulations (Codigo Interno). Members meet regularly in the General Assembly in spaces like school buildings or specially built *ejido* houses (Schroeder and Castillo 2013). Attendance is compulsory and absence is financially penalized. Collective matters are decided by majority vote.

Spatially, the *ejido* territory is divided into housing lots, private farming and communal use. Collective governance and action occur in communal

areas. These areas usually constitute resources best exploited communally, such as pasture or forest. The assembly ensures fair distribution of tasks and benefits. Fraud by members is generally punished internally (Barsimantov et al. 2010). The earnings are partially collected in *ejido* funds. Published sources highlight significant variation among *ejidos* in their collective vision and capacity for action, reflected in either large communal lands or predominantly private ones. The political economist Elinor Ostrom attributes these differing outcomes of collective action to the respective resources and social attributes of the particular resource system operating in a specific socio-spatial context (Ostrom 1990). However, solid cases for successful collective management exist for forest management and water supply (Schroeder and Castillo 2013; Hausmann 2014; López-Villamar et al. 2013).The map in figure 2 explores one such case study. Reduced government support in the 1970s and 1980s led to neoliberal reforms in 1992 under President Salinas de Gortari, before NAFTA (Barnes 2009). These reforms aimed to open the Mexican economy to global markets, privatizing *ejido* lands through the PROCEDE scheme. By 2006, about 93 per cent of *ejidos* were certified, allowing them to decide on privatization (Escobar 2006).

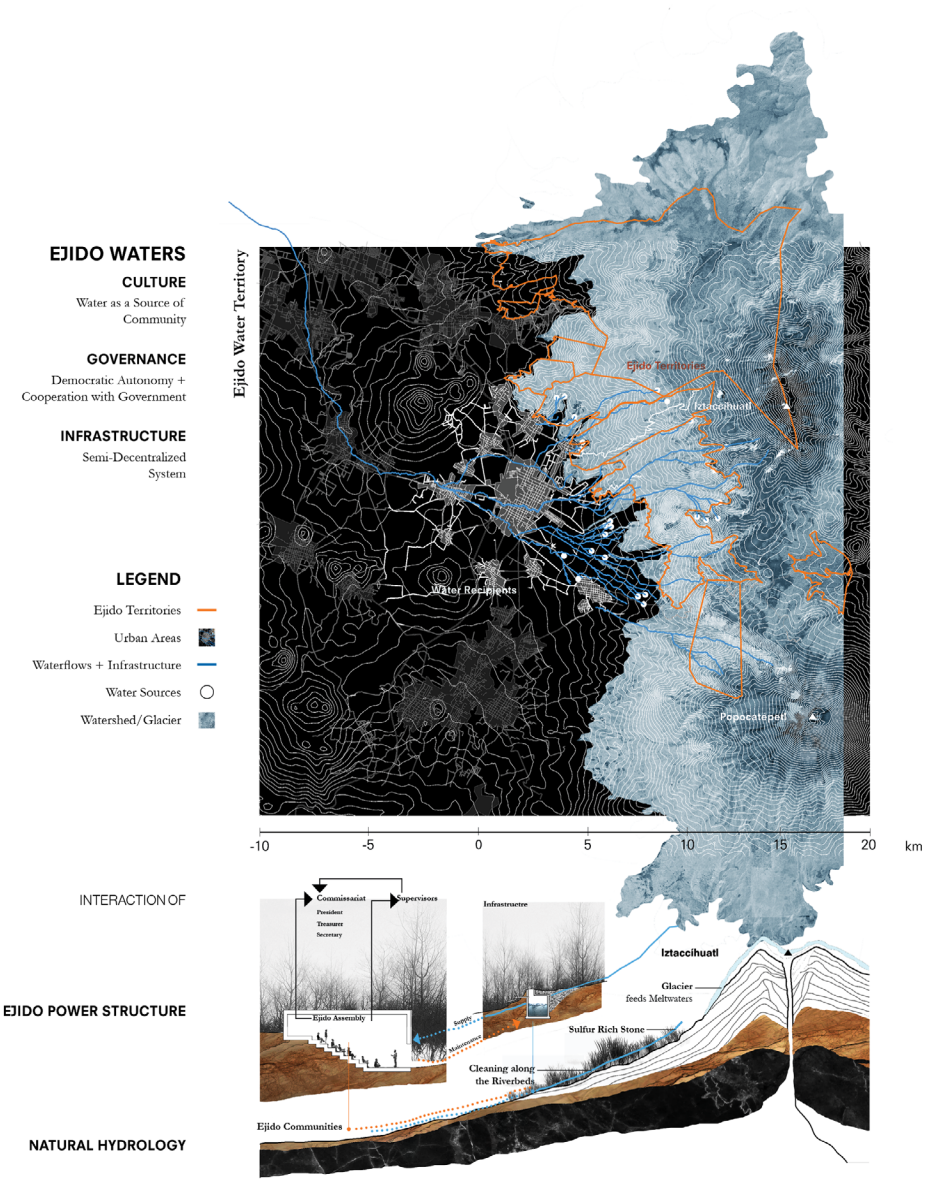
Despite the pressures, the system largely proved resilient to land privatization and the allure of external claims. This resilience suggests that translocating the *ejido* system from rural to urban areas offers an alternative to the subverted role of the state, society and water in Mexico City.

The Crisis of Modern Water

The crisis of modern water is rooted in the profound transformation of Mexico City's environmental and political landscape. By the late nineteenth century, unsanitary conditions, including inadequate sewage, polluted supply systems, and floods from the contaminated Lake Texcoco, prompted the first large-scale modern projects. These were only the beginning. They reshaped the city for capitalist urbanization and industrialization efforts, commodifying water and consolidating state power in newly formed authorities as the sole providers of water (Vitz 2018).

Central to modern water is the promise of universal access to modern residents. Access, however, has been systematically impeded for marginalized residents. This has been the case regardless of time frame or spatial configurations like for the rent strikers of the 1920s (Vitz 2018), the self-help housing settlers until the 1990s (Ward 1990) and working-class neighborhoods under the neoliberal *tandeo* system (Eakin et al. 2016; Schwarz 2021). Water access was thus politically weaponized to keep receivers in line with the benefactor's interests (Eakin et al. 2016; Vitz 2018; Ward 1990). State interventions under the paradigm of modern water have reshaped the hydrological landscape (fig. 3). As the omnipresent lakes were gradually drained for a "smog-infested desert of concrete sprawl," the "Paradise" of past centuries was parched. These transformations complicate a revival of traditional practices, as Matthew Vitz (2018) argues.

Environmentally, the supply and drainage systems heavily strain the hydrological limits of the basin and beyond. Local aquifers are exploited at an unprecedented rate, leading to subsidence and infrastructural failure (Tellman et al. 2018). The interbasin water transfers plunder water sources of neighboring watersheds. Full operational capacity is restricted, destroying local agricultural livelihoods (Perló and González



Source:

Lopez Villamar, Silvia Marlen. *"Sistemas de deshielo para abastecimiento de agua potable: Organización comunitaria y multicomunitaria en la región de los volcanes" (Meltwater Systems for Potable Water Supply: Community and Multi-Community Organization in the Volcano Region).* Master's thesis, Colegio de Postgraduados, Programa de Estudios en Desarrollo Rural, 2012.

^ Fig. 2 The Popocatépetl Ejidos manage water through glacier-melt capture infrastructure, showcasing local governance for sustainable hydrological livelihoods (Source: David Sauer, 2024).

2009). Surface sealing from unplanned urban expansion causes severe rainy season flooding. Sewage waters are only partially treated and transported to the Mezquital Valley, where the unfiltered water is used in agricultural production (Carrera-Hernandez 2018). In light of the myriad of social and environmental distortions, it is undeniable that modern water is in crisis and has been for a long time.

Climate change and inadequate infrastructure threaten to worsen the existing distortions. Continuing the current system increasingly becomes a Sisyphean task with dire consequences for over 20 million inhabitants. Nevertheless, systemic asymmetry incentivizes the continuation of modern water adaptations as a means to sustain political power, an "immediately viable and familiar way to increase robustness," which might jeopardize long-term sustainability (Tellman et al. 2018).

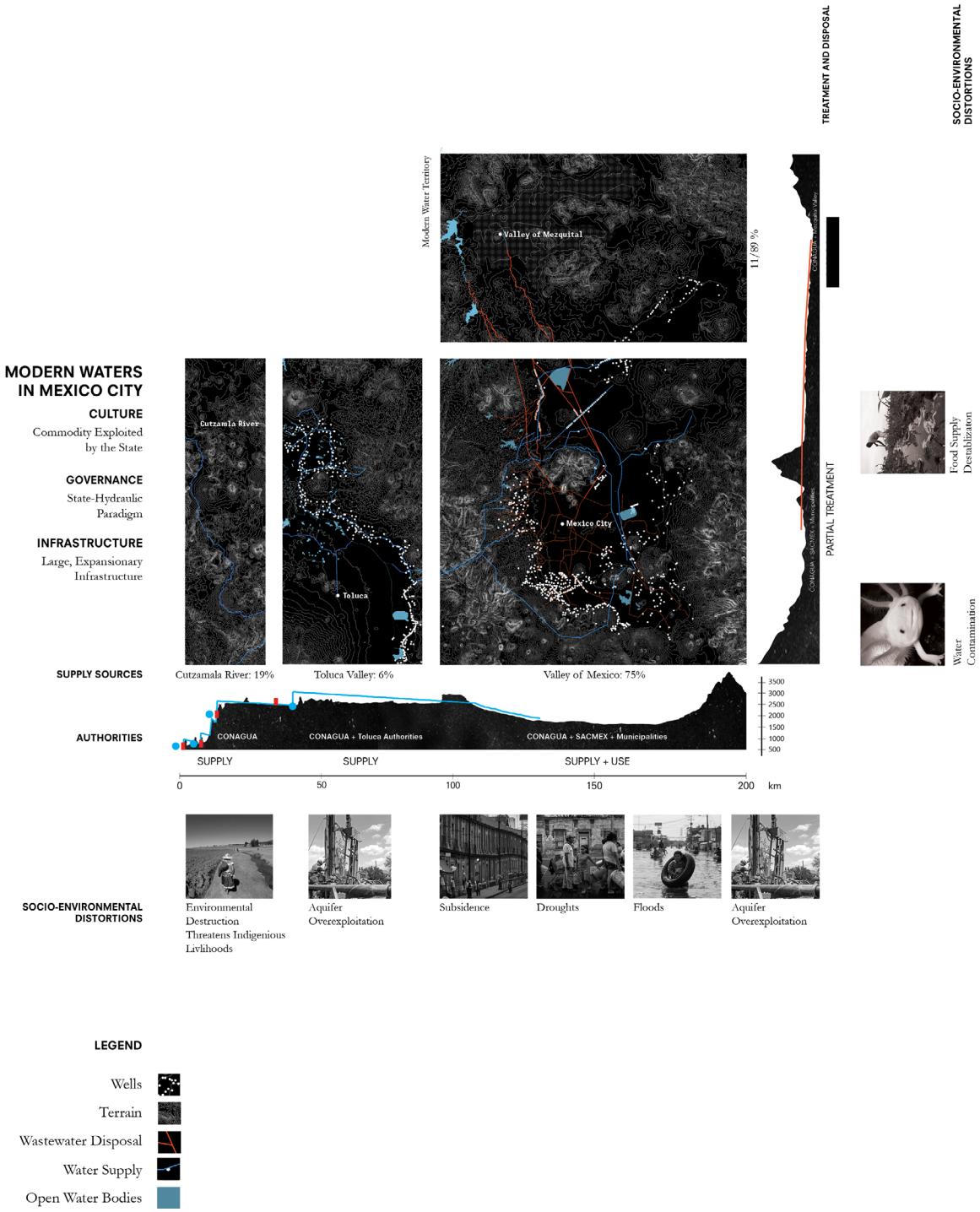
Decentralized water practices have emerged as an alternative to the classic state provisions. The NGO Isla Urbana has installed rainwater systems for about half a million people in cooperation with the Secretaría del Medio Ambiente (Isla Urbana, n.d.). In theory, constructed wetlands will lower water vulnerabilities on a large scale in the city (Barkwith and Godoy-Lorite 2021). However, if left to individuals these solutions may become just another form of capitalist "exploitation". As Peter M. Ward vividly depicts in his analysis of self-help housing developments in the last century, the absence of systemic solutions forced working-class residents to endure exploitation both in the workplace and during their limited free time by constructing their own homes (Ward 1990). The fragmentation of communities and their interests has been a fundamental factor in shaping the exploitative nature of modern water in Mexico City.

The Need for Local Governance and *Ejido* Translocation

As socio-environmental pressures mount on an inadequate water system, many of modern water's inherent distortions are in danger of being reproduced. Researchers warn that a crisis "may not be very far off" (Tortajada and Castelán 2003). The specific configuration of systemic corruption and the inherent power asymmetry of the state-hydraulic paradigm has left little hydrological agency, as evidenced by numerous political dealings surrounding water. Here Linton's (2013) "recombination of water and society" with "people at the center" becomes imperative. *Ejidos* could inspire a future platform for such a "people-centered" and local governance. With decentralized hydrological technologies, such a translocation could create a distinctly Mexican "water-sensitive community" (Chadfield et al. 2022), addressing:

- Participation and collective governance – Unlike modern water's individualization, an *ejido* structure emphasizes community participation and collective decision-making. The General Assemblies would form the backbone for residents to address social and environmental needs in an inclusive and crucially accountable fashion.

- Ownership and "water culture" – Under modern water, residents are relegated to being water consumers while relying on public servants to speak for their interests. The *ejido* mixed-ownership model of communal, private and social parcels fosters a platform for collective emancipation and equitable resource use. Collective governance and ownership ensure the "visibility of water," fostering



^ Fig. 3 Modern water has altered watershed boundaries, causing interconnected socio-environmental distortions. The map explores these issues' multi-dimensionality and relationships (Source: David Sauer, 2024).

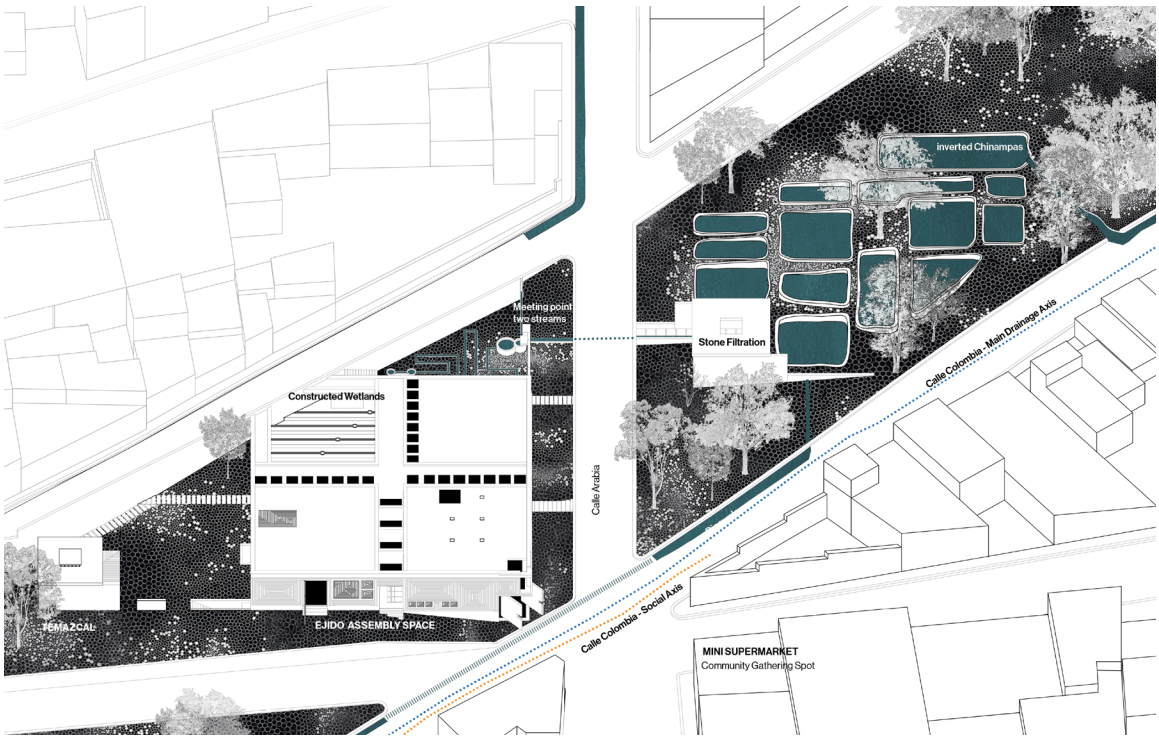
a stronger water culture and conservation (Brown 2017).

- Autonomy and external relations – *Ejidos* derive much of their agency from their well-defined territoriality. Like self-help housing, this could limit external actors' power while establishing a direct identity. However, this does not need to be an exclusive interpretation of autonomy. Some *ejidos* show that relationships with external actors can be based on sustainable cooperation with authorities and other *ejidos* (López-Villamar et al. 2013).

A Proposal for an *Ejido* Community Building

Due to the lack of economic alternatives in the post-war boom, urban working-class residents were pushed to self-build their houses on land with precarious titles, so-called irregular settlements. Limited institutional involvement required the population to organize and advocate for infrastructure provisions. While an important precedent for collective action, the process should not be romanticized, as "self-build can increase labor exploitation and contribute to capital accumulation" (Connolly 1982). Nevertheless, the resulting close-knit character of these communities provides a favorable foundation for an *ejido* translocation. I chose one of these former settlements, Mexico 68, which is a parched area for weeks at a time, as a site for my intervention. To this day, water access in the neighborhood remains limited, with residents sometimes not receiving water for days on end. Paradoxically many streets flood during the rainy season.

The proposed *ejido* is structured around the central role of the assembly space (fig.4), like



^ Fig. 4 The building complex is situated in an underutilized green space along the main drainage and social axis. Its components (right to left) – bioswales, inverted *chinampas*, stone filtration systems, constructed wetlands and an underground cistern – are designed to reengage the public with water while transforming the neglected area (Source: David Sauer, 2024).

^ Fig. 5 The facade plays upon the rich architectural heritage of Aztec temples. It interprets the cultivation of water streams/ripples through human intervention, publicly displaying a narrative even in the absence of water in the dry period (Source: David Sauer, 2024).

its rural counterpart. The density of the urban context allows reimagining the governance spaces and hydrofunctional components to be intertwined. This combination spatializes water's social, political and cultural proximity to the social fabric around it. The site is on a lively street, also serving as the neighborhood's key drainage axis. The expressive façade (fig. 5), referencing Aztec temple exteriors, is a visual attraction for visitors and *ejidatarios*. Water ripples cultivated by human intervention are artistically interpreted. The relevance of water even in its absence during the dry period is publicly and visibly celebrated.

The interior contrasts the busy exterior with a quiet atmosphere, operating similarly to religious facilities. Functionally the building captures, cleans and stores urban water runoff from the street using eco-technologies. The individual components (fig. 4), such as bioswales collecting water in an artificial riverbed at the street edges, a series of water ponds in the park to store the unfiltered water, a stone garden filtering large debris, a constructed wetland patio (fig. 7) and the underground walk-in cistern, are atmospherically "charged" to visibly and sensually engage the *ejido* with water in a positive manner (fig. 6, 7). The material pallet of plants, rammed earth walls, volcanic stone elements and underground water storage mirrors the geological conditions that would "naturally" clean rainwater (fig. 7).

The proposed hydrological interventions aim to establish a platform for further local transformation. This process is defined through social components, specifically democratic deci-

sion-making through the *ejido* institution and engagement through education. These intangible components are spatialized through the *ejido* assembly space and a hydrological library. Both spaces are typologically bound to water but also physically, as openings in the roof allow filtered rainwater to enter. The combination of social and hydrological interventions aims to establish a prototype for urban hydrological *ejidos*. This process imagines the hydrological landscape of Mexico City as a myriad of distinct local conceptions, a condition long lost to the abstraction of modern water.

The design of the building complex reflects on the use of heritage in a severely altered context, specifically which aspects ought to be continued, how and by whom. It achieves this through typological innovation by recombining the governance and infrastructural spaces of an *ejido* case study, referencing and further developing vernacular architectural heritage by incorporating Aztec elements such as aqueducts and stone masonry traditions and promoting a collective water culture through the visible and artistic spatialization of water infrastructure.

The proposal does not recreate what has been lost. It integrates traditional and modern approaches to collectively living with water in a distinctly Mexican interpretation. Nevertheless, the proposal carries implications for other water heritage projects. Heritage is not a static concept; it is locally developed and fluid, shaped by the values and contributions of communities. The approach challenges top-down interpretations of heritage, embracing a distinctly bottom-up perspective that empowers communities to define and develop their collective narratives.

^ Fig. 6 The building is not a fully enclosed space sheltering against the elements. Water permeates the exterior, creating points of interaction between people and water (Source: David Sauer, 2024).

^ Fig. 7 The vernacular patio purifies water with constructed wetlands (Source: David Sauer, 2024).

Conclusion

Modern water in Mexico City replaced Indigenous collective ownership with the state-hydraulic paradigm. Central to this transformation was the promise of universal access for its modern residents, a promise yet to be fulfilled. The consequent transformations of the twentieth century have overstretched hydrological limits. Climate change threatens to further destabilize an already unstable water system, with serious implications, especially for marginalized communities

Hope remains, as modern water's technological lock-in has overlooked decentralized solutions. Adopting eco-technologies could tap underutilized water sources such as rain and grey water. However, the decentralization of supply, use and treatment will only amount to a solution with a parallel decentralization of power. Without this, it risks becoming another avenue of capitalist exploitation, as self-build housing has proved to be. Nevertheless, these technologies offer a foundation for implementing decentralized water governance.

Over the past century, *ejidos* have proven resilient in governing common resources and ensuring equitable, sustainable distribution in cooperation with the state. Thus, translocating the *ejido* system to the urban landscape of Mexico City could offer a platform to address many of the distortions of modern water. Corresponding

interventions, like the proposed *ejido* complex in Mexico 68, must celebrate a positive relationship with water by making it visible in its infrastructure and governance spaces.

Despite modern water's destructive history over the past century, the future of Mexico City remains to be determined. The relentless demand for increased water supply is deeply tied to the inherent power imbalance. Authorities "choose what environmental signal or threat to respond to, when it matters and for whom, and how to respond" (Tellman et al. 2018). This selective response has clearly favored those close(r) to power. Therefore, the continued expectation that the state will act as the ultimate authority on water must be questioned. Water is a human right, but like many rights before it, it is to be collectively upheld. Only then does Mexico City stand the chance to "unparch Paradise."

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References

Bakker, Karen J. 2004. *An Uncooperative Commodity: Privatizing Water in England and Wales*. Oxford University Press. https://doi.org/10.1093/oso/9780199253654.001.0001.

Barkwith, Andrew, and Antonia Godoy-Lorite. 2021. "Socio-Hydrological Vulnerability Index (SHI)." https://app.mexicoshr.com/.

Barnes, Grenville. 2009. "The Evolution and Resilience of Community-Based Land Tenure in Rural Mexico." *Land Use Policy* 26, no. 2: 393–400. https://doi.org/10.1016/j.landusepol.2008.05.007.

Barsimantov, James, Alexis E. Racelis, Grenville Barnes, and Maria DiGiano. 2010. "Tenure, Tourism and Timber in Quintana Roo, Mexico: Land Tenure Changes in Forest Ejidos after Agrarian Reforms." *International Journal of the Commons* 4, no. 1: 293–318. http://dx.doi.org/10.18352/ijc.102.

Brantz Mayer. 1874. "Mexico as it was and as it is." *J. Winchester*.

Brown, Kate P. 2017. "Water, Water Everywhere (or, Seeing Is Believing): The Visibility of Water Supply and the Public Will for Conservation." *Nature and Culture* 12, no. 3: 219–45. https://doi.org/10.3167/nc.2017.120302.

Carrera-Hernandez, Jaime J. 2018. "A Tale of Mexico's Most Exploited—and Connected—Watersheds: The Basin of Mexico and the Lerma-Chapala Basin." *WIREs Water* 5, no. 1: e1247. https://doi.org/10.1002/wat2.1247.

Chadfield, Sian J., Yongping Wei, and Scott N. Lieske. 2022. "Water Sensitive Communities: A Systematic Review with a Complex Adaptive Systems Perspective." *Journal of Environmental Planning and Management* 67, no. 5: 1077–1103. https://doi.org/10.1080/09640568.2022.2147421.

Connolly, Priscilla. 1982. "Uncontrolled Settlements and Self-build: What Kind of Solution? The Mexico City Case." In *Self-help Housing: A Critique*, edited by Peter M. Ward, 118–41. Mansell.

Eakin, Hallie, Amy M. Lerner, David Manuel-Navarrete, Bertha Hernández Aguilar, Alejandra Martínez-Canedo, Beth Tellman, Lakshmi Charli-Joseph, Rafael Fernández Álvarez, and Luis Bojórquez-Tapia. 2016. "Adapting to Risk and Perpetuating Poverty: Household's Strategies for Managing Flood Risk and Water Scarcity in Mexico City." *Environmental Science & Policy* 66 (December): 324–33. https://doi.org/10.1016/j.envsci.2016.06.006.

Escobar, A. 2006. *Presentación del Secretario de la Reforma Agraria en una Conferencia de Prensa* [Presentation by the secretary of agrarian reform at a press conference]. August 4, 2006, Mexico City. [In Spanish.]

Flores Hernandez, Luis Angel. 2020. "Revisiting the Mexican Ejido: Envisioning Alternative Land Tenures in Guadalajara, Mexico." In *Communities, Land and Social Innovation: Land Taking and Land Making in an Urbanising World*, edited by Pieter Van Den Broeck, Asiya Sadiq, Ide Hiergens, Monica Quintana Molina, Han Verschure, and Frank Moulaert, 181–94. Edward Elgar Publishing. https://doi.org/10.4337/9781788973779.

Isla Urbana. n.d. "Our Progress." Accessed November 29, 2024. https://islaurbana.org/en/.

Hausermann, Heidi E. 2014. "Unintended Developments: Gender, Environment, and Collective Governance in a Mexican Ejido." *Annals of the Association of American Geographers* 104, no. 4: 784–800. https://doi.org/10.1080/00045608.2014.910075.

Kourí, Emilio. 2015. "La invención del ejido" [The invention of the ejido]. *NEXOS*, January 1, 2015. https://www.nexos.com.mx/?p=23778.

Linton, Jamie. 2014. "Modern Water and Its Discontents: A History of Hydrosocial Renewal." *WIREs Water* 1, no. 1: 111–20. https://doi.org/10.1002/wat2.1009.

López-Villamar, Sara M., Tomás Martínez-Saldaña, and Jacinta Palerm-Viqueira. 2013. "Communities in the management of drinking water systems: volcano region, Estado de México." *Agricultura, sociedad y desarrollo* 10, no.1: 39-58.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action.* Canto Classics. Cambridge University Press.

Perló Cohen, M., and A. González. 2005. ? *Guerra por el agua en el Valle de México? Estudio sobre las relaciones hidráulicas entre el Distrito Federal y el Estado de México.* [War for water in Mexico Valley? Analysis of the hydraulic relationships between the federal district and the state of Mexico]. Programa Universitario de Estudios de la Ciudad, Universidad Nacional Autónoma de Mexico.

Schroeder, Natalia Mariel, and Alicia Castillo. 2013. "Collective Action in the Management of a Tropical Dry Forest Ecosystem: Effects of Mexico's Property Rights Regime." *Environmental Management* 51, no. 4: 850–61. https://doi.org/10.1007/s00267-012-9980-9.

Schwarz, Anke. 2021. "Hydraulic Standby: Anticipating Water in Mexico City." *Ephemera: Theory & Politics in Organization* 21, no. 1: 173–96.

Siebe, Christina, and Enrique Cifuentes. 1995. "Environmental Impact of Wastewater Irrigation in Central Mexico: An Overview." *International Journal of Environmental Health Research* 5, no. 2: 161–73. https://doi.org/10.1080/09603129509356845.

Tellman, Beth, Julia C. Bausch, Hallie Eakin, John M. Anderies, Marisa Mazari-Hiriart, David Manuel-Navarrete, and Charles L. Redman. 2018. "Adaptive Pathways and Coupled Infrastructure: Seven Centuries of Adaptation to Water Risk and the Production of Vulnerability in Mexico City." *Ecology and Society* 23, no. 1: art1. https://doi.org/10.5751/ES-09712-230101.

Tortajada, Cecilia, and Enrique Castelán. 2003. "Water Management for a Megacity: Mexico City Metropolitan Area." *AMBIO: A Journal of the Human Environment* 32, no. 2: 124–29. https://doi.org/10.1579/0044-7447-32.2.124.

Vitz, Matthew. 2018. *A City on a Lake: Urban Political Ecology and the Growth of Mexico City*. Duke University Press. https://doi.org/10.1215/9780822372097.

Ward, Peter M. 1990. *Mexico City: The Production and Reproduction of an Urban Environment*. G. K. Hall.

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