



Corruption and corruption reform in the Water Sector: Dirty water: Illustration of water corruption modalities from three Mexican regions

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The authors discussed in a companion report² how water professionals conceptualise, experience, and address (or not) corruption in their sector. This report grounds knowledge about specific water corruption issues by taking as an example a country with both endemic corruption and increasing water stress: Mexico. We chose this country partly because there are numerous and well-documented water corruption problems, and partly because the primary author is from Mexico and knows the regions well.

The first section of the paper shows that, at the national level, Mexico has made important changes in its water legislation, and participated in a number of anti corruption initiatives. However, these being non-binding, implementation has often been patchy and half-hearted, and high levels of corruption persist. In the water sector, this translates into ambiguously defined responsibilities across agencies, opaque governance systems, politicised water agencies, a generalised lack of accountability, and poor supervision, all of which were deepened by the decentralisation of water and sanitation services in the last decades.

The second section looked at three regional water systems in the country: the northern states of Zacatecas and Sonora, the Yucatán Peninsula and the central Estado de México. We argue that there are several critical corruption dimensions of the water crisis. In the northern states, we observe the over-exploitation of aquifers, the contamination of the water destined to urban consumption by mining activities, and the unjust distribution of water sources between the private sector and the public urban sector, between rich and poor neighbourhoods and within the agricultural sector. In the south of Mexico, water corruption is driven by magnates of the tourism industry (an important subset of the blue economy) taking advantage of weak regulatory frameworks and the limited capacity of government agencies to properly assess and monitor new developments.

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² Martinez-Rossignol, Palmer-Moloney and Pyman "Corruption and corruption reform in the Water Sector: How can water professionals make a difference? A question made more urgent by climate change CurbingCorruption November 2022. Available at CurbingCorruption <https://curbingcorruption.com/sector/water/>

In the final section, the authors provide an example of how to use the water corruption typology - discussed in more detail in the first report - to analyse real-life situations and identify the specific corruption issues that were present in each of the cases examined.

Acronyms

- AMLO: Andrés Manuel López Obrador - Incumbent Mexican President
- ASF: Auditoría Superior de la Federación - Supreme auditing body
- CAEM: Comisión de Aguas del Estado de México - Water Commission of Mexico state
- CIDE: Centro de Investigación y Docencias Económicas - Economic Research and Teaching Centre, a well known and prestigious higher education and research centre
- Conagua: Comisión Nacional de Agua - National Water Commission
- CPC: Comités de Participación Ciudadana - Citizen Participation Committees
- FEMDHC: Fiscalía Especializada en materia de Delitos relacionados con Hechos de Corrupción - Specialised Prosecutor for Corruption-related Crimes
- INAI: Instituto Nacional de Acceso a la Información - National Institute of Transparency, Access to Information and Protection of Personal Data
- INEGI: Instituto Nacional de Estadística y Geografía - National Institute of Statistics and Geography
- LFRFC: Ley de Fiscalización y Rendición de Cuentas de la Federación - General Oversight and Accountability Law
- LGRA: Ley General de Responsabilidades Administrativas - General Administrative Responsibility Law
- LGSNA: Ley General del Sistema Nacional Anticorrupción - General Law of the National Anticorruption System
- MIA: Manifestación de impacto ambiental - Environmental Impact Assessment
- M&E: Monitoring and Evaluation
- NGOs: Non-governmental organisations
- OECD: Organisation for Economic Cooperation and Development
- PGR: Procuraduría General de la República - Attorney General
- Profepa: Procuraduría Federal de Protección al Ambiente - Federal Attorney for Environmental Protection
- SDGs: Sustainable Development Goals
- Semarnat: Secretaría del Medio Ambiente y Recursos Naturales - Secretary of the Environment and Natural Resources
- SNA: Sistema Nacional Anticorrupción - National Anticorruption System
- USGS: United States' Geological Survey
- WaSH: Water, Sanitation and Health
- WIN: Water Integrity Network
- WHO: World Health Organisation

Introduction

This report is a companion report to the paper: *“Corruption and corruption reform in the Water Sector: How can water professionals make a difference? A question made more urgent in the face of climate change”*.³

The purpose of this research was to test the idea that one of the best ways to develop practical solutions to corruption problems is through the efforts of professionals working in the sector. This idea comes from the sector-based anti-corruption approach of the research network [CurbingCorruption](#), co-founded by Mark Pyman and Professor Paul Heywood. Such new thinking suggests that the best way to develop practical solutions to corruption problems is by being specific to the sector, such as health, education, police and water. The first part of this research project was interviewing water practitioners. Fifteen of whom work professionally with water, whether in industry, government or academe, mostly with worldwide experience, and five of whom were from civil society and the media.

In order to better ground knowledge about the specific corruption issues in the water sector, we also looked, in a parallel project reported in this second paper, at the ways that corruption is impacting water outcomes in one high-risk part of the world, Mexico. We looked at three regional water systems in Mexico: the northern states of Zacatecas and Sonora, the Yucatán Peninsula and the central Estado de México. We chose Mexico partly because the water corruption problems there have been well documented, and partly because the primary author is from Mexico and knows the regions well.

I. Corruption and reform in Mexico

Despite the relatively simple working definition used by Transparency International, the World Bank and leading NGOs – “abuse of entrusted power for private gain” – corruption is a culturally embedded and tricky concept. Though a thorough philosophical discussion of what exactly constitutes corruption is beyond the scope of this article, it is useful to highlight four distinctions that are relevant to Mexico:

- financial corruption (bribing, money laundering) vs. non-programmatic distribution
- macro-level or systemic corruption
- illegal vs. illicit financial flows
- corruption tendencies in water monopolies

Corruption is not just about financial rewards for individuals, as “private gain” can also take the form of political or electoral gains; and it can benefit people but also their parties, special interest groups or strategic allies. Keeping this in mind makes it easier to extend the definition of corruption to

³ Martinez-Rossignol, Palmer-Moloney and Pyman “Corruption and corruption reform in the Water Sector: How can water professionals make a difference? A question made more urgent by climate change CurbingCorruption November 2022. Available at CurbingCorruption <https://curbingcorruption.com/sector/water/>

include things like regulatory capture or non-programmatic distribution. In a nutshell, regulatory or policy capture means that organised interests (financial elites, powerful religious organisations, corporate lobbies...) exert such pressure over elected officials that they can circumvent democratic decision-making and shape the regulatory environment to advance their interests, often enacting regressive policies. As for non-programmatic distribution, it has been used to describe situations in which the rules allocating public funds to a segment of society are “determined behind closed doors with no clear criteria” - which prevents public debate, criticism from the opposition and legal oversight - and/or when distribution is not actually constrained by these rules. Some examples of non-programmatic distribution are: vote buying and turnout buying, pork-barrel politics, clientelism and patronage.⁴ Such practices facilitate the bribing of civil servants, absenteeism, capture of funds at different state levels, and discrimination, all of which reduce the quality and availability, and increase the costs of public service delivery, including water distribution and sanitation.

Second, corruption at the macro-level - defined as a “systemic, organised and collective process, sometimes socially normalised” - is highly relevant to Mexico. The Mexican framework developed by CIDE researchers Oliver Meza and Elizabeth Perez is particularly useful, as it considers “dyadic interactions as symptomatic and [connects] the most visible manifestations of corruption to more systemic and harder to identify informal systems.” Their work also argues that corruption is consolidated in local governments because of 1. opacity in operations, 2. weak checks and balances, 3. the existence of informal networks spanning several layers of hierarchy and enabling clientelism or the fixing contracts, and 4. organisational integration mechanisms “foster[ing] or hamper[ing] corrupt schemes by means related to culture, hierarchy and the professional preparation of public officials”.⁵ This analysis advances our study insofar as in Mexico, municipal governments are where citizens interact the most with the state, but they are also the government institution they trust the least, and where most experiences of corruption take place. Additionally, local governments matter because they play a central role in the management of water utilities, which opens the door for practices such as clientelism or the instrumentalisation of water resources for political gains. Further proof that corruption is a systemic or organisational phenomenon is that the supply and demand for corruption are shaped by regime-level factors. For instance, there is evidence that the organisational capacity of labour unions or peasant organisations (that is, their ability to recruit, retain and mobilise members) determines the extent to which they will try to obtain particularistic benefits for their members - thereby falling in a patronage trap keeping them dependent on local parties - or advocate for programmatic policies shaping long-term sectoral competitiveness.⁶

Third, there is an important distinction to be made between that of *illicit*, as opposed to *illegal* financial flows. As explained by Khan et al., legal definitions of corruption are of limited use because differences across jurisdictions and over time make comparisons difficult. Furthermore, when special interest groups have a strong influence over policy making, there might be practices that are technically unlawful but relatively harmless, while others that can easily be deemed corrupt and have

⁴ Stokes, Susan, et al. 2013. *Brokers, Voters and Clientelism. The Puzzle of Distributive Politics*. Cambridge: Cambridge University Press [Link](#)

⁵ Meza, Oliver and Pérez-Chiques, Elizabeth. “Corruption consolidation in local governments: A grounded analytical framework”. *Public Administration*. 2020; 1– 17. <https://doi.org/10.1111/padm.12698>

⁶ Palmer-Rubin, Brian. « Evading the Patronage Trap: Organisational Capacity and Demand Making in Mexico », *Comparative political studies*. 2019, vol.52 n° 13-14. p. 2097-2134. [Link](#)

negative consequences, do not violate any laws. Thus, the expression *illicit flows* designates cross-border transfers “that are illegitimate because they are based on an abuse of power and cause harm to society”.⁷ Talking of *illegitimacy* as opposed to *illegality* also highlights the power relations that many low- and middle-income countries have with the multinational corporations operating in their country. This is particularly relevant for our study because most corruption scandals involving water do not occur in the water sector itself, but in adjacent sectors dependent on water resources such as mining or tourism. Since these are precisely the sectors in which a handful of multinationals tend to dominate the market, when these participate in sophisticated corruption schemes, they can have a tremendous impact on water in terms of pollution, availability, access, and distribution, as will be illustrated by the cases of Zacatecas and Yucatán.

Fourth, the water sector has natural monopoly characteristics. It is a resource with no substitutes, requires substantial capital investments, and water distribution is often constrained by specific legislation such as the federal ownership of all water resources in Mexico and the municipalities’ responsibility in managing the network. As a result, water companies are very few, large and old, which facilitates collusion and the instrumentalisation of the resource. On top of that, water is a public service, and is therefore subject to some corruption risks associated with service delivery, from absenteeism of public servants and ghost workers, to the capture of public funds and resources, selective delivery and outright discrimination. The impact of these on low-income groups is twofold, as corruption in public service delivery acts as both a regressive tax (because poor households end up paying more for basic services than their rich counterparts), and a discriminating mechanism (because the poor are more likely to be discouraged from using public services by corruption). It also has implications for governance, as it reduces the efficiency of public spending and thereby, the incentives and public support for them, with potentially large implications for equity and social justice.⁸

Finally, Water Integrity Network (WIN), the global NGO most engaged in water integrity and anti-corruption work, takes a different approach, defining not ‘corruption’ but ‘integrity’. “WIN defines water integrity as the use of vested powers and resources ethically and honestly for the delivery of sustainable and equitable water and sanitation services in the public interest (WIGO, 2021). Water integrity is: implicit in human right obligations, explicit in administrative justice laws of many countries, and operationalised through the principles of transparency, accountability, participation and anti-corruption (TAPA Framework)”.⁹

A. Corruption reform

Mexico has been rather active in the global discussion on corruption and has enacted some efforts, notably when it comes to transparency and data collection. Access to information is a Constitutional right, and the country has several laws detailing the implications of transparency at different levels of government (such as the Federal Law on Transparency and Access to Public Information) and institutions to enforce them, including the INAI and the INEGI. As a member of the Open

⁷ Khan, M., et al. 2019. “Illicit Financial Flows: Theory and Measurement Challenges”. ACE SOAS Consortium, Working Paper

⁸ Kaufman et. al (2008) “How Does Bribery Affect Public Service Delivery? Micro-Evidence from Service Users and Public Officials in Peru”

⁹ Water Integrity Global Outlook 2021, [here](#)

Government Coalition, Mexico has also taken part in the Extractive Industries Transparency Initiative (EITI) “which is recognised as the global standard for good governance of oil, gas and mineral resources, though it has not committed to joining the Fisheries Transparency Initiative (FiTI) [promoting the transparent and sustainable management of ocean resources and the blue economy], despite the importance of its marine fisheries sector”.¹⁰ Regarding a different aspect of water sector data production, Mexico is one of the countries currently developing a WaSH (water, sanitation and health) account and implementing the TrackFin standardised methodology developed by the WHO. The goal is to help countries “understand their WaSH financial situation for more effective financial planning, programming and use of funds to improve WaSH services and service delivery. [This methodology notably seeks to answer the questions:] 1. What is the total expenditure in the WaSH sector? 2. What are WaSH funds being spent on? 3. Who pays for WaSH services and how much do they pay? 4. Who are the main WaSH service providers and how much are they spending?”.¹¹ Although this initiative seems promising, it is a newly launched endeavour whose impact is yet to be determined.

Internationally, Mexico is part of the OECD Working Group on Bribery in International Business Transactions, and has undergone several rounds of monitoring regarding its recommendations. The latest report dating from 2018, concluded that the country “initiated a number of significant anticorruption reforms since [2011], which once fully functional could have a positive impact on the implementation of the Convention, particularly enforcement.” On a more negative note, in a 2020 report by Transparency International, the country was listed as having “little or no enforcement” of the OECD Anti-Bribery Convention.¹² On the other hand, Mexico does participate in the Open Government partnership, and have included specific water commitments at their local and national plans.¹³

Later on, the 2000s saw the gradual adoption of some anti-corruption measures, such as the requirement by the 2009 Mexican Procurement Law to have a social witness in public contracts exceeding a certain threshold, which is one of the top recommendations to reduce corruption risks in contracting.¹⁴ Most importantly, the Peña Nieto administration launched in 2015 the SNA or Sistema Nacional Anticorrupción, an ambitious anti-corruption constitutional reform modifying several pieces of legislation to formalise and facilitate denouncing mechanisms over irregularities in public management. These reforms also led to the establishment of three central anti-corruption institutions:

- a technically autonomous anti-corruption prosecutorial body within the Attorney General (PGR) known as the Special Prosecutor’s Office for Corruption-Related Offences (FEMDHC)
- a Coordinating Committee to prevent, investigate and sanction corrupt actions
- a series of Citizen Participation Committees acting as a citizen monitoring body

¹⁰ Rovegno, Nicolás and Hayashida Harumi. “Results of the Tacking Stock assessment: Government transparency in marine fisheries of Mexico” *Fisheries Transparency Initiative (FiTI) and Causa Natura*. 2021. [Link](#)

¹¹ “Reflecting on TrackFin 2012–2020: key results, lessons learned and the way forward”. *World Health Organisation*. Geneva: World Health Organisation. June 2021 [Link](#)

¹² Transparency International. 2020. “[Exporting Corruption, Progress report 2020 : assessing enforcement of the OECD Anti-bribery convention](#)”

¹³ See WIN [here](#)

¹⁴ Olaya, Juanita. “Integrity Pacts in the water sector. An implementation guide for government officials”. *Water Integrity Network and Transparency International*. 2010 [Link](#)

This move comes at a crucial time, as by 2016, nearly half of the country's state governors had records or open investigations for corruption, and the SNA was an initiative born out of mounting pressure by the social, government and academic spheres.¹⁵ Furthermore, the institutional changes that arose were "another key step meant to increase independence and concrete results of investigations into criminal networks, including crimes committed by or in collusion with authorities, and [...] the systems' basic infrastructure now exists in the vast majority of states". Nonetheless, implementation has been slow and uneven, and analyses have revealed a number of weaknesses, notably regarding the newly autonomous (state) Prosecutor's offices, which are particularly important given that "any anti-corruption effort that seeks a broad impact in Mexico requires both robust implementation at the state level, and tangible results in the realm of criminal justice", and that "most corruption-related crimes can be expected to fall under state (not federal) jurisdiction, so the role of prosecutors at the state level is crucial". Areas of concern include "legal mandates and caseloads that are both under-and over-inclusive of corruption crimes", massive understaffing and underfunding, lack of transparency (not giving public updates on investigations, withholding information requested by other members of the SNA system such as Citizen Participation Committees), "a frequent lack of autonomy (including budgetary autonomy) *vis-à-vis* potentially corrupt actors under investigation, as well as from institutions that could interfere with prosecutors' work at the behest of such actors or for political reasons", and a tendency of "the anti-corruption office to merely [drag] out investigations without real intentions of resolving them".¹⁶

These examples show that corruption does have an important place in Mexico's political agenda, and that the highest levels of government are aware of the challenges and possible measures to reduce corruption. However, international engagements are made with organisations whose recommendations are non-binding and "the devil is in the details". The case studies and interviews show that, despite many national and international commitments to transparency, integrity and anti-corruption on paper, reforms are often adopted only half-heartedly, enforcement leaves much to desire and subsequent monitoring and evaluation is seemingly inexistant.

B. Water reform in Mexico

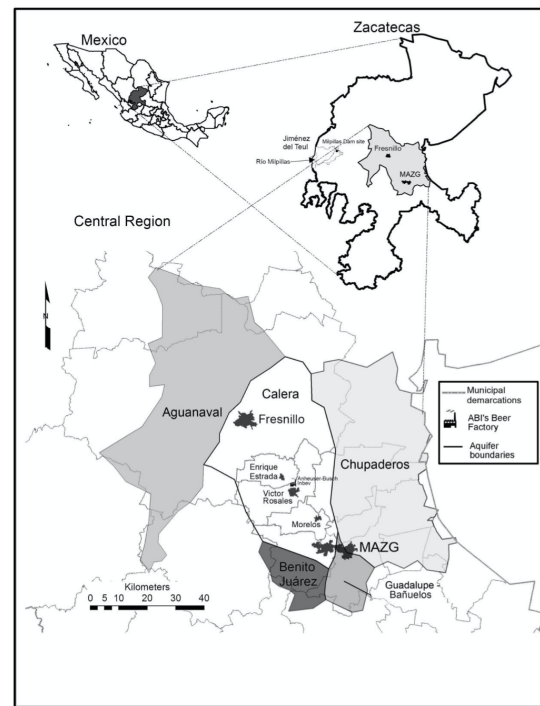
At the national level, Mexico has also made important changes in its water legislation. Detailing all these developments is beyond the scope of this paper and would require more legal expertise. However, several features are especially noteworthy. According to Article 27 of the Constitution, the federal government owns and has the prerogative to regulate the use of underground sources through concessions and place bans on overdraft aquifers. The 1992 National Water Law went

¹⁵ Tirado Teodocio, Héctor y Aguirre Arias, Francisco Miguel. "El aporte de las denuncias al combate a la corrupción. Una revisión de la literatura y análisis del caso mexicano." *Proyecto Iceberg*. 2021. [Link](#)

¹⁶ Brewer, Stephanie and Ngong, Moses. "Mexico: A Closer Look at State Anti-Corruption Prosecutors". Washington Office for Latin America (WOLA). March 2021. [Link](#)

further by designating the Conagua to oversee the use and administration of water in name of the executive and integrated in the legal framework the Dublin Principle of establishing the economic value of water, liberalising the sector and launching deep structural changes in the management of the Water Supply and Sanitation sector. Under the Presidency of Zedillo (1994-2000), there was also a “decentralisation of diverse responsibilities for the management of water to newly created state-level and regional agencies including State Water Commissions (CEAs, Comisiones Estatales del Agua), Basin Councils (Consejos de Cuenca), and Groundwater Technical Committees (COTAS, Comités Técnicos de Aguas Subterráneas)”.¹⁷ As commented by WIN “One of the key issues that makes the water and sanitation sectors particularly vulnerable to corruption risks is the lack of clear roles and responsibilities and clear governance systems. This is the case in Mexico, in which the decentralisation of the sector has led to a lack of accountability and clear supervision. The extensive conversations to support the proposals for a new national law of water in Mexico capture some of these key topics.”¹⁸

Figure 1. Aquifers in the Central Region of Zacatecas.



Source: Authors' elaboration with the technical support of Antonio Reyes Cortés.

II. Illustrating water corruption through three Mexican examples

A. Zacatecas and Sonora: Extractive industries and political ecology

The case of Zacatecas presents several dimensions of water corruption and is well documented. In their article published in *Water Alternatives*, Tetreault and McCulligh present in parallel a “historical analysis of the material and political economic conditions” that led to water scarcity in the state, and an analysis of the discourses equating the building of hydraulic infrastructure with ideas of modernity, progress and the “hydraulic mission” that marked political attitudes towards water management in the post-WWII decades. The authors also introduce the notion of *institutionalised corruption* “to explain how water- and value-grabbing takes place in Mexico not as individual acts of corruption by water authorities, but rather as a consistent pattern of bias in the generation and application of environmental standards that favours private interests over the common good, [and]

¹⁷ Tetreault and McCulligh, 2018

¹⁸ Written communication to the authors, November 2022, from Daniela Patino-Pinertos of WIN

entails sidestepping environmental laws to provide rent-seeking extractive capital with access to scarce natural resources.”¹⁹

Apart from that, the article underlines three critical dimensions of the water crisis in the state. First, the over-exploitation of all five aquifers of the central region of Zacatecas (Aguanaval, Benito Juárez, Calera, Chupaderos and Guadalupe Bañuelos). Second, the contamination of the water destined to urban consumption by mining activities, which presents concentration levels of heavy metals far past the maximum limits set by Mexican legislation, even though such legislation is quite permissive compared to international standards such as the WHO’s recommendations. Third, the unjust distribution of water sources between the private sector and the public urban sector (industrial farmers and beverage producers receive a larger share of the water extracted from wells and of better quality than the city, which violates priority usage laws); between rich and poor neighbourhoods in the metropolitan area of Zacatecas and Guadalupe; and within the agricultural sector, as over half of the agricultural water concessions from the Calera aquifer are granted to the 3.2% of farmers with over 30 hectares of land, while the ¾ of farmers owning less than 10ha only receive 19%.²⁰

Tetreault et McCulligh conclude that institutional corruption in Zacatecas takes the form of “shoddy water accounting (estimated budget increasing after bidding process), concessions for extraction of additional volumes of water where it is banned, tolerance of partial transfers of concessions to cover up higher extraction rates in practice, low levels of enforcement on metering requirements, and on-paper changes of water availability in order to get around drilling bans”. Lastly, they follow the call of scholars such as Rutgerd Boelens “for the study of ‘hydrosocial territories’ [and] for the re-politicisation of analyses going beyond politically neutral interpretations of water problems, which portray solutions in terms of ‘technical knowledge’, ‘rational water use’ and ‘good governance’.”

One particular case involved the Canadian mining company Goldcorp and its subsidiary Minera Peñasquito, located in the Mazapil municipality in the north of Zacatecas. Since 1988, new water concessions have been prohibited in the hydrological basin of Zacatecas because of a risk of aquifer overdraft. However, in 2004, Goldcorp submitted requests to secure enough water for the opening of a mine in Mazapil to extract gold, silver, lead and zinc, and the Conagua suggested they make the technical study to evaluate whether the Cedros aquifer had enough water availability for that. Two years later, the Conagua issued the new water concessions based on the estimations of the company’s report and the Semarnat approved the opening of the mine, a decision that had a number of concerning consequences. For starters, the implantation of the company was flagged as a case of “destruction of the territory and land dispossession”, leading to relocations and the appearance of ghost villages. Then, water availability started to decrease: the spring that supplied surrounding communities dried up and wells around the state quickly started emptying. This is unsurprising considering Newmont Goldcorp has “concessions representing the amount of water needed to give every person in Zacatecas 68 litres per day, for

¹⁹ Quotes and map from Tetreault, Darvy et McCulligh, Cindy. « Water grabbing via institutionalised corruption in Zacatecas, Mexico », *Water alternatives*. 2018, vol.11 n° 3. p. 572-591. [Link](#)

²⁰ Tetreault and McCulligh, 2018. Water grabbing via institutionalised corruption in Zacatecas, Mexico », *Water alternatives*. 2018, vol.11 n°3. p. 572-591. [Link](#)

a year". Initially, the company had promised to provide drinking water to all affected communities, and many of them entirely rely on the water "granted" by the mine for human consumption, even though its quality is often dubious and health problems from water contamination are common. A number of anomalies also started appearing in documents, including irregularities in payment receipts for concessions (mismatching dates, registries under different names), seemingly unjustified tax forgiveness and, our personal favourite, astonishing numbers in the technical reports on which the Conagua relied to allocate concessions. In 2007, the Peñasquito mine affirmed that the average annual recharge of the Cedros aquifer was 10.1 million cubic metres. The following year, when Goldcorp asked for a permit to extract more water, the Peñasquito mine reported an annual recharge rate of 54.4 million cubic metres. It was later found that "water authorities had both falsified studies and committed acts of omission in permitting mining of water from aquifer", unless the aquifer miraculously started recharging at a rate 435% faster precisely when the mining company was planning to expand its activities.²¹

The manipulation of information - which falls in the "Corruption in data collection and sharing" category of CurbingCorruption's typology - can also be seen in a second case, that of the Milpillillas dam project, which was at the heart of the political campaign of former Zacatecas Governor Miguel Alonso Reyes. At his request, the Conagua and the Mexican Institute of Water Technology (a government research centre) issued an Environmental Impact Assessment - MIA - that was over 500 pages long. Yet, the document lacked basic data, such as the calculations behind the assertion that the dam would allow aquifers to replenish in just a few decades²², elemental information about the dam wall - including its height, breadth, and retention capacity - and estimates of the Milpillillas River's water volume and quality at different times of the year.²³ Other irregularities that emerged were (1) the company that won the bidding process was the one with the second most expensive proposal; (2) the doubling of cost estimates *after* the construction began; and (3) the early termination of the project by the federal government because deadlines were not met and the contract had been signed before securing the release of the land where the dam was to be built. It is worth noting that this was collectively owned by three *ejidos*²⁴ whose inhabitants opposed the construction.²⁵

The case of Buenavista del Cobre in the state of Sonora (see map and remote sensing image below) is somewhat similar to the Peñasquito mine in Zacatecas. Buenavista del Cobre, the largest copper mine in the country, caused one of the worst environmental catastrophes in Mexico. The events and their impact can be summarised in a series of numbers ²⁶ :

Top: Buenavista del Cobre mine and nearby municipalities - Source: Cárdenas, 2018 | Bottom: "El río Sonora, tres años después de la catástrofe". *El Economista*. August 4th, 2017. [Link](#)

²¹ All the information from this example and the quotes are translations of the following reportage: Cerbón, Mónica y Gómez, Thelma. "Los explotadores de agua - Agua para la mina: Cómo minera Peñasquito dejó sin agua a comunidades de Zacatecas". *Mexicanos contra la Corrupción y la Impunidad* (MCCI). 2020? [Link](#)

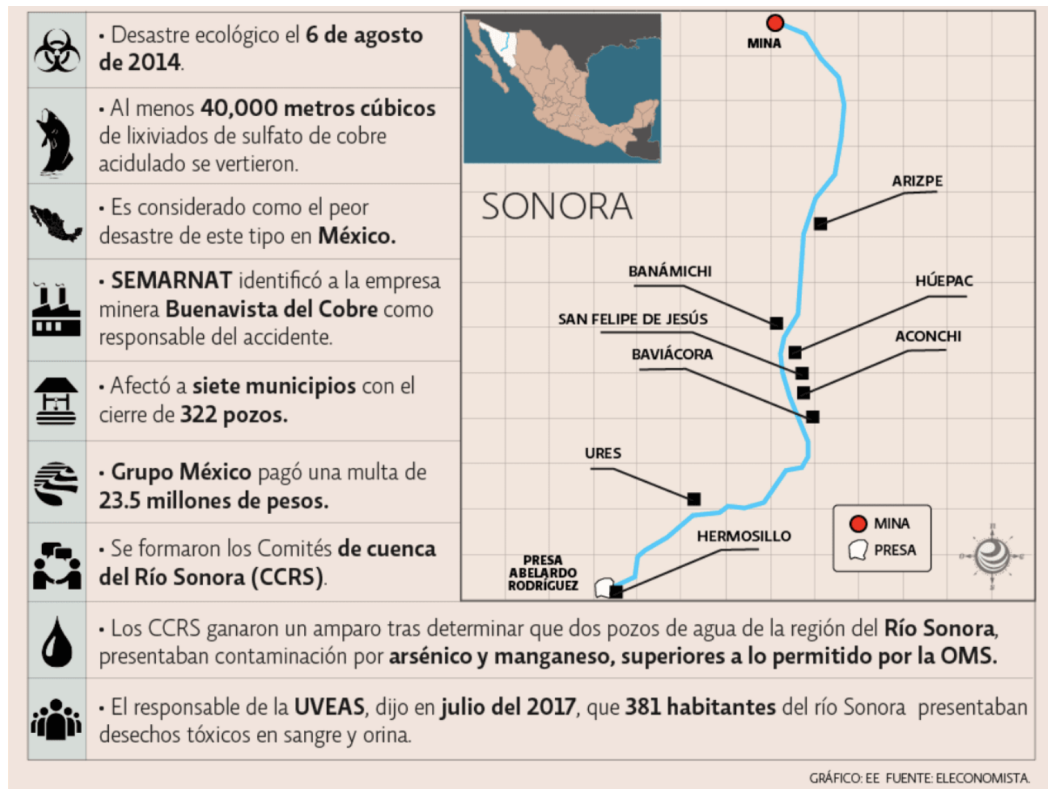
²² This claim was later denied by the SAMA or Secretary of Water and the Environment.

²³ Tetreault and McCulligh, 2018

²⁴ A form of communal ownership of land

²⁵ Aguirre, Alberto. "Milpillillas, la presa fantasma". *El Economista*. August 28th 2019 [Link](#)

²⁶ Cárdenas, Priscilla. "Informe río Sonora: La omisión que quitó vidas a miles". *Proyecto Puente y Aristegui Noticias*, con el apoyo de la Iniciativa para el Periodismo de Investigación del ICFJ y CONNECTAS [Link](#)



- **14 years** passed prior to the disaster without a single inspection of the plan and equipment by water agencies such as the Conagua or Profepa.
- **40 000 cubic metres** of heavy metals (iron, copper, cadmium, manganese and aluminium) were spilled in the riverbed of the Sonora River on August 6th, 2014.
- **25 hours** passed before the mine notified local authorities of the spill, during which time neighbouring municipalities kept drinking and using the water.
- **22 million people** were directly affected by the heavy metal contamination, as they relied on the river for household consumption, agriculture, and breeding, upon which their livelihood depended.

- **55 irregularities** were found in the investigation following the spill, including technical failures and violations of basic safety and environmental regulations by the mine.
- The equivalent of **\$2 million USD** today - \$23.5 million MXP - was levied against the mine, which is insignificant compared to the company's profits and even to the personal fortune of its shareholders, including for example Germán Larrea: CEO of Grupo México and 45th in *Forbes'* list of billionaires, with a net worth of **\$23.8 billion USD** as of September 2022. The company was also required to pay for damages, notably by giving handouts to affected families, securing the distribution of drinking water while treatment plants were set up, cleaning up the river and building a health centre specialised in water-borne diseases. However, the indemnisation process was filled with new abnormalities, so the affected people received a water tank and approximately \$8000 MXP (**less than \$400 USD**) per household without any previous socioeconomic assessment to determine their needs, the hospital was never completed, and the medical staff never came, despite the rise of water diseases and worrying concentration levels of heavy metals found in foodstuffs and human blood in subsequent (independent) studies.

The spill received very little media attention and at the time of writing, the municipalities affected have still not recovered from its public health consequences and the loss of economic activities it caused.

B. Yucatán and Quintana Roo: Trouble in (Mayan) Paradise?

The south of Mexico is also prone to water corruption, driven by the magnates of the tourism industry, an important subset of the blue economy. The Mayan Riviera has completely transformed into a resort area since the 1990s *building blitz* kickstarted by then Quintana Roo state's Governor Mario Villanueva, who ensured for his state government 400ha of federally owned land that he divided and hastily sold to developers a couple of years later. These were operating in a sort of legal



vacuum in a context marked by weak institutions and strong politicians, to whom developers quickly became close. As a result, places like Cancún emerged on a "build first, ask later" (*más vale pedir perdón que permiso*) approach, whereby developers would "[buy] up beachfront on the cheap and [build] their hotels and condominiums as quickly as possible, even if that mean[t] bypassing time-consuming bureaucratic approvals".²⁷ That development negatively impacted the environment of the Mayan Riviera as well as neighbouring

²⁷ Friedland, Jonathan. "Paved Paradise: In Mexico's Yucatan, It's Develop First, Ask Questions Later - Lax Laws Fuel Hotel Boom But Also Lead to Social, Environmental Problems - Spanish Firms Lead Charge". *Wall Street Journal. Europe*. 1999. [Link](#)

villages, which did not have the necessary infrastructure to accommodate the economic migrants from all over the country seeking jobs in the booming industry. Without much surprise, the quick returns were exploited by land buyers “who made sure to cement their political connections” and some high-ranking political figures including Governor Villanueva, who was later tried and jailed for corruption allegations and connections to drug cartels.²⁸

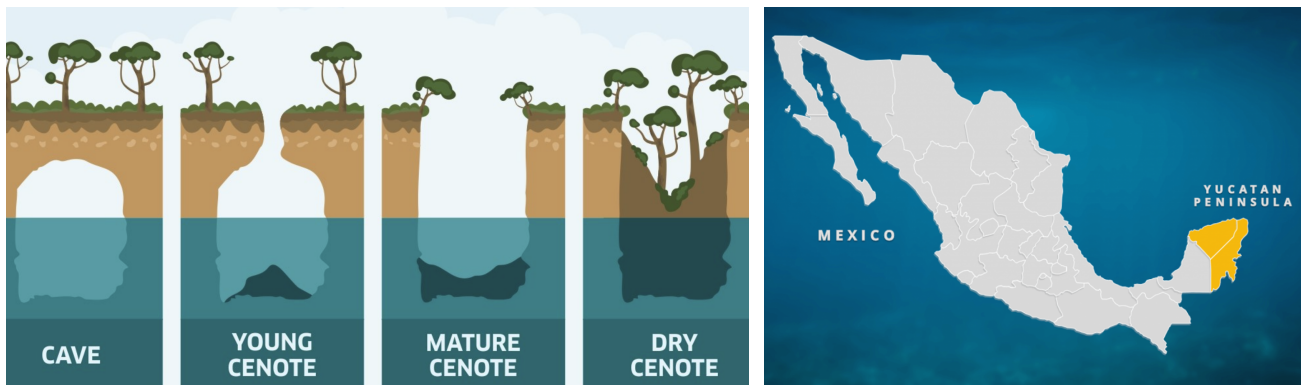
In the neighbouring state of Yucatán, the new park project of the ecotourism monopolist, Grupo Xcaret, illustrates this trend and exemplifies water corruption in the production and sharing of data. For this project, named Xibalbá, Grupo Xcaret produced two MIAs to get the necessary authorisations. In the first one, they sustained that the making of an underground tunnel network connecting different *cenotes*²⁹ would not affect the eight ones near the site nor alter their ecosystem, despite the heavy construction work involved and the intense light and sound effects contemplated for the subterranean park. The second MIA, submitted a year later in 2021, recognised that the initial construction work had actually had an impact on the *cenotes* Yacolbá, X-tut and Sisbichén, but minimised their ecological footprint. Besides, the project that was approved by the Semarnat was centred on contact with nature and foresaw levels of investment and infrastructure that were drastically inferior to those given by the company in the public presentation of the project. In the end, the Xibalbá park was closed permanently by the Profepa, but water and environmental government agencies were slow to react and by the time they did in 2022, Grupo Xcaret had already caused an “ecocide and irreversible damage” to the *cenotes*.

Similarly, the company Enerall, which exploits groundwater for agricultural purposes, has caused significant harm due to the poor enforcement of legislation and a generalised lack of monitoring. Conagua has never inspected the quality of the water extracted from the wells, has not ensured safety regulations are followed at the company’s installations near Tizimin (despite having made 755 inspections to other companies in the same area), and has not demanded Enerall’s compliance with rules to mitigate environmental damages. This may be because numerous conflicts of interest were not addressed properly. For instance, Alfonso Romo García, the founder of the company, is close to President AMLO and former presidents Fox and De Gortari. Garcia has also occupied several important political positions and served as AMLO’s Chief of Staff (2018-2020) even though his brother was still a board member and active shareholder of Enerall. Additionally, “the annual average availability of the aquifer of the state of Yucatán has plummeted by 50% in the last decade, coinciding with the jump in the allocation of concessions to exploit it in the last 10 years”. This has led local agricultors to flag increasing water scarcity and accuse Enerall of harming *cenotes*, including one that was found irreversibly capped. Yet, the Conagua still bases its decisions to hand-out permits on data about the aquifer’s replenishing capacity from 2003 and, although the staff recognises it would be good to update the estimates, since “there is still plenty of water”, it is not their priority. Given that the Yucatán aquifers are the largest sources of freshwater in Mexico, one can only hope

²⁸ Friedland, 1999

²⁹ NB: A cenote is “a natural pit, or sinkhole, resulting from the collapse of limestone bedrock that exposes groundwater. The regional term is specifically associated with the Yucatán Peninsula of Mexico.” - Source: [Cenote - Wikipedia](#) For further reading, see [this article](#) on karst topography and hydrogeology.

that when this abundance ends, the relevant agencies will notice and act upon it before it is too late.³⁰



Left: What are cenotes? | Right: Map of the Yucatán peninsula. Source: [What are Cenotes? Everything You Need to Know](#)

The connections between industrialists and the political elites are also evidenced by the mega-project of the Tehuantepec Isthmus corridor bridging the ecoregions of the states of Veracruz, Tabasco, Oaxaca, Chiapas, Quintana Roo and Yucatán. As detailed by Celín et al., the CEOs of the construction companies involved in the construction of the Railroad of the Tehuantepec Isthmus and the Jáltipan Salina Cruz pipeline, are associated to politically exposed persons, which could hide conflicts of interest and facilitate corrupt practices. For example:

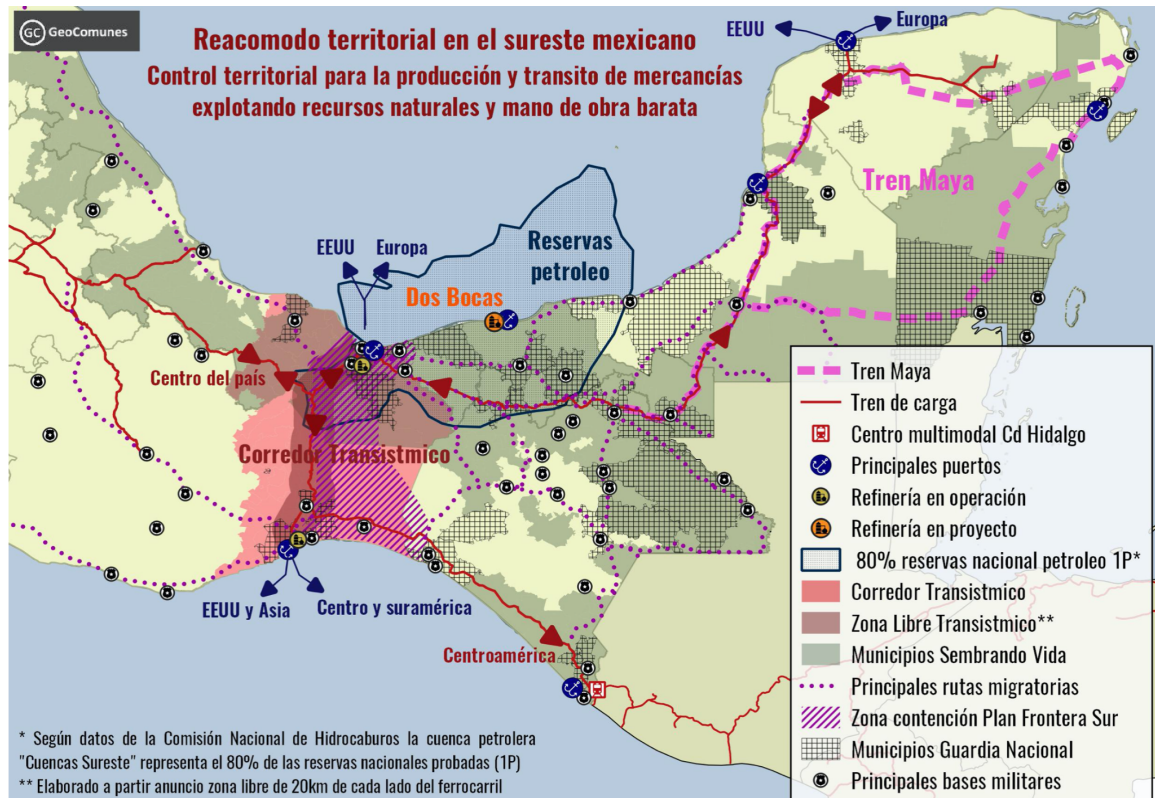
- the Spanish *Grupo Azvi* has been accused of gaining numerous contracts in Mexico by considering itself an ally of the family of former president Salinas de Gortari and in 2013, its President Manuel Contreras was investigated in relation to a political corruption scandal in Spain for financing a political party in exchange for procurement contracts.³¹
- the Mexican *Grupo Industrial Hermes* is a strategic ally of the multinational corporations Odebrecht and Alstom (both infamous for their involvement in major corruption scandals) and has accusations for Human Right violations, forced relocations and overexploitation of water during the construction of a different project (the Zapotillo dam in Jalisco)³²
- the *Comsa Corporación* (Catalonia), which belongs to the wealthy Miarnau family, has also been said to use its personal ties to high-ranking government officials to gain contracts.³³

³⁰ Janet Cacelín, Alejandro Melgoza y Sergio Rincón. “Daño ambiental en Yucatán: la explotación descontrolada de fuentes de agua en el paraíso maya”. *Univision Noticias*, en alianza con *CONNECTAS*, *Proceso*, *Aristegui Noticias*, *Ruido en la Red y Vice en Español*. Marzo 2020. [Link](#)

³¹ Clavijo Flórez, Isabel. “Corredor del Istmo de Tehuantepec. Las asociaciones público privadas y sus impactos territoriales en México”. *PODER* (Proyecto sobre Organización, Desarrollo, Educación e Investigación). 2020. [Link](#)

³² *Ibid.*

³³ *Ibid.*



Source: "Corredor Interocéánico del Istmo de Tehuantepec, Mexico". *Environmental Justice Atlas*. July 2021. [Link](#)

c. Estado de México: Striking back through citizen complaints

The third illustration is that of a residual water treatment plant in San Mateo Huitzilzingo, in the Estado de México. The project presented multiple procedural breaches and risk areas, such as irregularities in land usufruct contracts, as well as in funding allocations and financial reports. Additionally, within a matter of days and without providing a documented technical justification or informing local residents, the construction company decided to change the agreed-on location of the plant, and started building in a private terrain in exchange for tax breaks and access to clean water for the owner. This might seem like a detail, but the abrupt change of location actually had serious consequences. Poor planning created an array of technical issues, as the new site was on top of a water table that risked being contaminated and caused cracks and floods to the infrastructure, resulting in significant delays in construction (up to 517 days) and a 26% budget increase. But most importantly, the change of location *de facto* excluded the original beneficiaries of the project, that is, the *ejidatarios* of Huitzilzingo, whose livelihood depends on agriculture, who had advocated for the treatment plant in the first place and who had yielded the original parcel. In any case, 6 years after the works began, the plant has never properly functioned and the Amecameca river is as contaminated as ever.³⁴

The relevance of this case mainly comes from what happened after, as several civil organisations decided to mobilise mechanisms of citizen complaints to shed light on what happened and get

³⁴ López, Pamela y Salvatierra, Sarahí. "La lucha por el saneamiento del agua en Huitzilzingo. La denuncia ciudadana sobre irregularidades en la construcción de la Planta de Tratamiento de Aguas Residuales". ControlaTuGobierno, Fundar Centro de Análisis e Investigación. 2021. [Link](#)

compensation. These include digital platforms (SIDECA, [Ciudadanos Alertadores de la Corrupción](#)), citizen participation committees implemented with the 2015 National Anti-corruption System reforms, applications for the inclusion of cases in the Annual Audit Program of the ASF (the supreme audit body of the country), and formal complaints substantiated on the Federal Oversight and Accountability Law. This joint social audit set an important precedent for the *ejido* communities, who received training on issues related to transparency and accountability holding, learned about technical issues and helped collect information and raise awareness. However, the process did not go as swiftly as they had hoped: the Water Commission of Mexico State (CAEM) refused to disclose the

necessary information to build up a case until government transparency agencies forced them to, and some documents were handed out up to a year and a half after being requested.



Localización de San Mateo Huitzilzingo en México



Localización de San Mateo Huitzilzingo en Estado de México

In their report, the involved NGOs detail the challenges and successes of each mechanism, saying for example that although the legal framework gives public agencies the ability to investigate cases, there are still normative constraints to what they can do and their role is limited in practice. As for the existing tools for individuals to denounce irregularities or supposed corruption in the doings of government bodies, they are deemed inaccessible and hard to use, as whistleblowers and plaintiffs “have to be very active to collect evidence, follow the case and be informed of decisions and results”. Still, there were some positive experiences with the ASF, as the process “opened communication channels with the organisations and the *ejidatarios*” and the concrete, actionable reform proposals listed in the report make some room for optimism.³⁵

III Typology corruption issues identified in the Mexican illustrations

The relevant issues from the corruption typology found in two of the three Mexican regions can be viewed in Tables 1 and 2 below (12 cases). For the third Huitzilzingo case (Estado de México), the main academic source did not provide enough information about the potentially corrupt actions that occurred during the building of the water treatment plant to build a similar table, as the focus was more on the complaint mechanisms that followed it.

³⁵ López and Salvatierra, 2021. | Source of the map: [San Mateo Huitzilzingo - Wikipedia](#)

Table 1 Corruption issues identified for Zacatecas and Sonora cases (highlighted)



Table 2 Corruption issues identified for two cases in the Yucatán peninsula



Annexe 1 Source information for Tables 1 and 2

Location: City, State	Main actors	Main sources read	Types of corruption identified from the typology
Cedros aquifer - Mazapil, Zacatecas	Canadian-based mining company Newmont Goldcorp (owner of Minera Peñasquito in Mazapil) and its director of corporate affairs Michael Harvey, Conagua, population of San Juan de Cedros	Reportage - Cerbón, Mónica y Gómez, Thelma. "Los explotadores de agua - Agua para la mina: Cómo minera Peñasquito dejó sin agua a comunidades de Zacatecas". Mexicanos contra la Corrupción y la Impunidad (MCCI). 2020 Academic paper - Boni, Andrés , y Garibay, Claudio , y Urquijo, Pedro , y Panico, Francesco . "Corporación minera, colusión gubernamental y desposesión campesina. El caso de Goldcorp Inc. en Mazapil, Zacatecas." Desacatos. Revista de Ciencias Sociales , no. 44. (2014): 113-142	1 3 4 13 16 17 (Milpillars) 20 21 22 31 33 36 to 40 42
Municipio de Cananea, Sonora (México)	Buena Vista del Cobre mine owned by Grupo México, Procuraduría Federal de Protección al Ambiente (Profepa), 22 million people from the affected municipalities (Arizpe, Aconchi, Banámichi, Baviácora, Huépac, San Felipe de Jesús and Ures)	Reportage - Cárdenas, Priscilla. "Informe río Sonora: La omisión qui quitó vidas a miles". Proyecto Puente y Aristegui Noticias, con el apoyo de la Iniciativa para el Periodismo de Investigación del ICFJ y CONNECTAS Link	2 3 4 11? 13 15 (likely) 17 20 22 33 34 37 38 39 40

Michoacán (Mexico)	Central Campesina Cardenista (CCC) and its secretary general Carlos González, Partido de la Revolución Democrática (PRD)	<p>Academic article - Palmer-Rubin, Brian. «Evading the Patronage Trap: Organisational Capacity and Demand Making in Mexico », Comparative political studies. 2019, vol.52 no 13-14. p. 2097-2134.</p> <p>Post from stakeholder website - "Central Campesina Cardenista acuerda seguir apoyando a AMLO y a la 4T desde los territorios". Central Campesina Cardenista. December 1st 2019</p> <p>Stakeholder website - RedCCAM</p>	<p>Based on article, no concrete proof</p> <p>15?</p> <p>16 ?</p> <p>19</p> <p>33</p> <p>34</p> <p>41</p>
Rancho Asnieros de Tizimín, Yucatán (México)	Enerall company (Grupo Plenus) Alonso Romo Garza (founder and former head of Enerall, subsequently coordinator of AMLO's electoral campaign, Chief of Staff, Secretary of the Treasury...) and Gustavo Romo Garza (brother of Alonso and shareholder in Enerall) PROFEPA (Procuraduría Federal de Protección al Ambiente) and CONAGUA	<p>Reportage - Janet Cachelín, Alejandro Melgoza y Sergio Rincón. "Daño ambiental en Yucatán: la explotación descontrolada de fuentes de agua en el paraíso maya ". Univision Noticias, en alianza con CONNECTAS, Proceso, Aristegui Noticias, Ruido en la Red y Vice en Español. Marzo 2020</p> <p>News article - Alonso Urrutia y Alma E. Muñoz. "Investigarán presuntos daños de Enerall a cenotes en Yucatán". La Jornada. Marzo 2020</p>	<p>Based on article, no concrete proof</p> <p>3</p> <p>4?</p> <p>5</p> <p>7</p> <p>9 (2 false MIAs)</p> <p>13</p> <p>16</p> <p>17 (possible irregularities in land accumulation scheme that granted Enerall 15,000 ha)</p> <p>22</p> <p>33</p> <p>34</p> <p>39</p>

Riviera Maya, Yucatán and Quintana Roo (México)	Mario Villanueva (former governor of Quintana Roo), developers Guillermo Portella Mur (Director of Grupo Oasis) and Roberto Chapur	Academic paper - Friedland, Jonathan. "Paved Paradise: In Mexico's Yucatan, It's Develop First, Ask Questions Later --- Lax Laws Fuel Hotel Boom But Also Lead to Social, Environmental Problems --- Spanish Firms Lead Charge", <i>Wall Street Journal</i> . Europe. 1999	No explicit mention but possible corruption in land fire-sales to developers 3 4? 16 17 21 22 33 34 37 38 39 41
Cenotes Yacolbá, X-tut and Sisbichén - Valladolid, Yucatán (México)	Owners of Grupo Xcaret: Miguel Quintana Pali and relatives, brothers Constandse Madrazo (Oscar, Marcos and Carlos, cousins of former Governor and PRI presidential candidate Roberto Quintana Pintado) PROFEPA (Procuraduría Federal de Protección al Ambiente), SEMARNAT (Secretaría del Medio Ambiente y Recursos Naturales)	News article - Avalos Lopez, Jair. "Grupo Xcaret minimizó daño a cenotes en Manifestación de Impacto Ambiental en Parque Xibalbá". <i>Por Esto</i> . Mayo 2022 Visual - Relationship between the Constandse Madrazo brothers and Deansfield Limited Co. (Malta) highlighted in the "Panama Papers" Offshore Leaks Database by the ICIJ (International Consortium of Investigative Journalists) Official document - Manifestación de Impacto Ambiental (MIA) - Desarrollo ecoturístico Xibalbá approved by the SEMARNAT and published by <i>PorEsto</i> in April 2022	Based on what I gathered from news articles, no concrete proof 4 ? 5 7 8 9 12 17 22 33 34 37 39 41 42

<p>Corredor del Istmo de Tehuantepec - Ecosystem formed by three ecoregions connecting Veracruz and Oaxaca with Tabasco, Quintana Roo, Yucatán and Chiapas (México)</p>	<p>Companies: Grupo Azvi; Grupo Industrial Hermes; Comsa Corporación</p> <p>Varios actors involved in the Corredor del Istmo de Tehuantepec: General Director Rafael Marín Mollinedo, federal government, SEMARNAT, SENER (Secretaría de la Energía), SHCP (Secretaría de Hacienda y Crédito Público)...</p> <p>Stakeholder associations</p>	<p>Reportage - Clavijo Flórez, Isabel. "Corredor del Istmo de Tehuantepec. Las asociaciones público privadas y sus impactos territoriales en México". <i>PODER</i> (Proyecto sobre Organización, Desarrollo, Educación e Investigación). 2020.</p> <p>Website - "Corredor Interoceánico del Istmo de Tehuantepec, Mexico". <i>Environmental Justice Atlas</i>. July 2021</p>	
<p>Huitzilzingo, Estado de México (Mexico)</p>	<p>Public bodies: CAEM (Comisión de Agua del Estado de México), Ayuntamiento de Chalco</p> <p>Civil society and NGOs: Comisariado Ejidal de San Mateo Huitzilzingo, ControlaTuGobierno, Centro de Análisis e Investigación Fundar, Comisión de Cuenca de los Ríos Amecameca</p> <p>Companies involved in the construction of the Huitzilzingo water treatment plant: AQUASÚ, Halcón Internacional de Proyectos Ecológicos</p> <p>Audit bodies: ASF, SFP (Secretaría de la Función Pública) and Comisión de Vigilancia de la Cámara de Diputados, OICs (Organismo Interno de Control) Conagua, Infoem (Instituto de Transparencia, Acceso a la Información Pública y Protección de Datos Personales)</p>	<p>Reportage - López, Pamela y Salvatierra, Sarahí. "La lucha por el saneamiento del agua en Huitzilzingo. La denuncia ciudadana sobre irregularidades en la construcción de la Planta de Tratamiento de Aguas Residuales ". ControlaTuGobierno, A.C. Fundar, Centro de Análisis e Investigación. 2021.</p>	<p>More about irregularities and poor planning than proven cases of corruption by individual office-holders</p> <p>7 17 20 36 ? 38 40 41</p>