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Toxic Landscapes in Sacred Wixaritari Territory: Chemicals and Food as Environmental Epigenetic Triggers in a Metabolic Epidemic in Mexico

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By

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Abstract

Toxic Landscapes in Sacred Wixaritari Territory: Chemicals and Food as Environmental Epigenetic Triggers in a Metabolic Epidemic in Mexico

Salvador Chava Contreras

My ethnographic research engages Wixaritari conceptions of sickness and healing that are rooted in a cosmology of body, landscape and non-human relationships responsible for maintaining wellbeing and balance in the universe. The landscapes are spaces of historical and ongoing resistance movements fighting against multiple threats of dispossession and environmental destruction. From a medical anthropological perspective, I examine the environmental epigenetics of toxic exposure and their implication for disease etiology, specifically, metabolic syndrome. Environmental epigenetics considers biology as a coevolving process that takes into account the historical, political and social dimensions of toxicity including the strategies Wixaritari use to address multiple environmental threats from local, state and national-corporate interests. There is growing concern for how contemporary life is being threatened during the Anthropocene as human activities are causing significant global destruction of earth's ecosystems. Such destruction disproportionately affects vulnerable populations, especially indigenous communities. Yet, the stories that

Wixaritari bodies and landscapes tell are not solely about doom and gloom. I argue instead that healing is embedded in indigenous landscape practices associated with fulfilling cargo mandates. Moreover, non-fulfillment of these obligatory relations may result in further imbalance between human and non-human that maintain order in the universe. While current threats to sacred sites have grown, these relations between Wixaritari care and governance of each other and their vast network of landscapes offer profound frameworks for how to move forward with collective life in the Anthropocene.

Dedication and Acknowledgement

A special thank you to the Department of Anthropology at UC Santa Cruz and the UC Office of the President for two terms of funding while writing my dissertation. I would like to express my deep and sincere gratitude to my dissertation advisor, Dr. Nancy N. Chen, whose insight and knowledge of medical anthropology helped steer this project in critical directions. A heartfelt thank you to Dr. Olga Nájera-Ramírez and Dr. Andrew S. Mathews for their expertise in Mexican anthropology and for their incredible support and encouragement. I could not have completed this research without each of their mentorship. I want to thank Dr. Pat Zavella for encouraging me pursue anthropology at UC Santa Cruz.

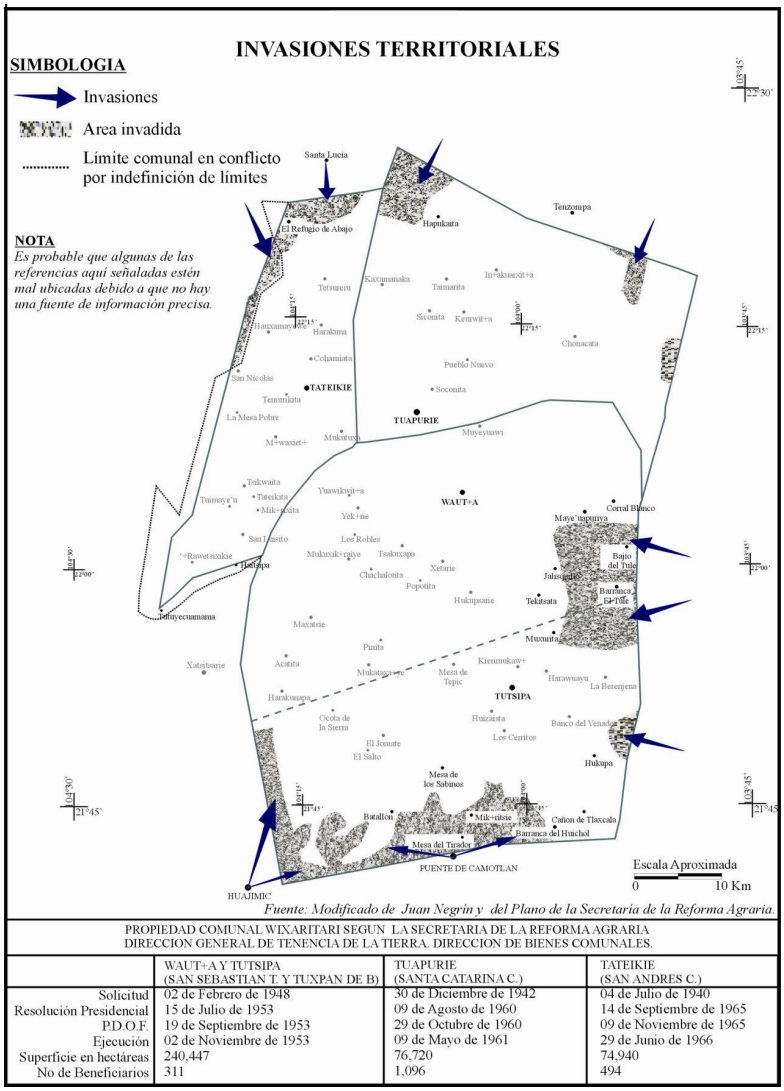
Introduction

"*La resistencia no es solo aguantar, sino construir algo nuevo*,"
—The resistance is not solely holding out but to construct something new.
Quote on a wall in the Sierra Wixárika

Over 600 Wixaritari (plural for Wixarika) descended from their mountain communities in the Sierra of northern Jalisco, Mexico, to Guadalajara's streets on August 20, 2014, forty years into a land dispute between Wixaritari and neighboring mestizo ranchers. The march was to the offices of the Secretary of Agrarian, Territory and Urban Development (SEDATU) and the Agrarian Tribunal, with the intent to take over the offices and force the return of ten thousand hectares that bordered San Sebastian, one of four Wixaritari *cabecera* communities.[1] The states of Jalisco and Nayarit bordered the disputed land (See Figure 1 Territorial Invasions below). Neither state had acted in response to the march or demands. The tension had been marinating as outside groups moved in. The Wixaritari at nearby Huajimic and La Yesca had felt like prisoners in their town. The risk of violence was palpable. Mestizo people gathered to protect their enterprises—such as cattle, agriculture, and recently, poppy fields cultivated by *narco* groups to supply the U.S. demand—within the disputed territory. Wixaritari had demanded federal arbitration via the Program for Social and Rural Conflict (COSOMER), formerly named the Secretary of Agrarian Reform, but nothing resulted from this action. SEDATU had recently changed administrations

[1] *Cabecera* is an official title with legal rights to hold elections and communal lands shared with smaller rancherias. Despite practicing local communal autonomy derived from Article 27 of the Mexican Constitution, the *cabecera* communities' elections are legitimized by Mexican state municipalities. Mezquitic has jurisdiction over Santa Catarina and San Andres.

with the recent elections and officials told Wixaritari leaders that the land dispute was no longer part of their agenda (Del Castillo 2017).[2]



PROPIEDAD COMUNAL WIXARITARI SEGUN LA SECRETARIA DE LA REFORMA AGRARIA
DIRECCION GENERAL DE TENENCIA DE LA TIERRA. DIRECCION DE BIENES COMUNALES.

	WAUT+A Y TUTSIPA (SAN SEBASTIAN T. Y TUXPAN DE B)	TUAPURIE (SANTA CATARINA C.)	TATEIKIE (SAN ANDRES C.)
Solicitud	02 de Febrero de 1948	30 de Diciembre de 1942	04 de Julio de 1940
Resolución Presidencial	15 de Julio de 1953	09 de Agosto de 1960	14 de Septiembre de 1965
P.D.O.F.	19 de Septiembre de 1953	29 de Octubre de 1960	09 de Noviembre de 1965
Ejecución	02 de Noviembre de 1953	09 de Mayo de 1961	29 de Junio de 1966
Superficie en hectáreas	240,447	76,720	74,940
No de Beneficiarios	311	1,096	494

Figure 1 Territorial Invasions denoted with arrows and shaded areas. Wixaritari cabeceras are in bold capital letters: Tuapurie (Santa Catarina), the cabecera of Inakuarxita (Nueva Colonia). Note Huajimic at bootom left (Ochoa-Garcia 2001).

[2] For a more extensive ethnographic studies on land disputes in Mexico see P.A. Dennis (1987) and M. Nuijten (2003).

Indigenous people from Huajimic decided to take direct action by setting up an encampment. The ranchers blocked the road, effectively leaving the protest camp without supplies. *La Voz de Los Cuatro Pueblos*, The Voice of the Four Pueblos, the radio station that services the Sierra's four main indigenous groups, made a call to action. Wixaritari arrived in five school buses with supplies for a long demonstration. Ranchers were lying in wait for the indigenous supporters, and the groups got in a standoff that lasted several hours. Local police arrived in just enough numbers to control the situation and open the road.

Figure 2 August 20, 2014, Wixaritari march in Guadalajara to offices of "SEDATU We Want a Solution" for restitution of disputed lands. Photo by Serio Mares, Nueva Colonia Facebook page.

Indigenous groups in La Yesca and Huajimic, adjacent to the large parcel of disputed land, had lived under low-intensity warfare with neighboring ranchers after this event. In 2017, an agrarian tribunal granted the disputed land back to the

Wixaritari community of San Sebastian (Del Castillo 2017). Ranchers threatened retaliation. On May 20, 2017, a Saturday afternoon, *sicarios*, hitmen, drove into San Sebastian and gunned down two Wixaritari leaders and a third leader the next day. In response to this attack, Wixaritari set up an *autodefensa Wixarika,* an armed defense group. Wixaritari leaders cited Cheran and Ostula in Michoacan as examples of successful auto-defense groups protecting their lands and their people from the narco-violence and government repression (Del Castillo 2017).

Wixaritari have had over a dozen land disputes like the one described above, some over sixty years old. Simultaneously, Wixaritari leaders maintain resistance work through legal cases, direct actions, and press events on approximately a dozen different fronts. Some of these include proposed megaprojects from extractive industries such as a proposed toxic waste dump, a tourist project, a hydroelectric dam project, and a botched clean-up by the government after a cyanide mining disaster. The Wixaritari lawyer Santos de la Cruz stated in a press conference organized by the Consejo Regional Wixarika por la Defensa de Wirikuta (herein Consejo Regional Wixarika) in Guadalajara in 2015, “They’re attacking us from all directions. We’re at war, and it’s a battle of attrition.” He’s from the pueblo of Bancos, whose lands are also in dispute with mestizos.

Santos’ statement from five years ago continues to inform this research project. In light of Wixaritari history, war is not obscure reality. Instead, warfare takes place in multiple social, psychological, and biological realms. The effects of a toxic landscape in the context of a resource war cannot be neatly bounded. Warfare is

diffuse, with lasting results over time. Whether the conflict manifests in the form of a mining accident, a mestizo or narco group trying to appropriate lands, or as a hydroelectric dam project, it is easy to see the trouble (Haraway 2016). However, it is more challenging to recognize chemical warfare when the chemicals are part of daily life.

The Journey to the Wixaritari Sierra: Trailer Ride

I drove a 2000 Nissan Frontier pick-up truck to my field site from California to the Sierra. I had a contact at the US-Mexico that works with freight trailers to ship vehicles into Mexico. My contact told me before I could avoid driving all the way into Guadalajara by sending my truck in a trailer carriage while I sit as a passenger. Just after registering with customs my contact explained that 500 meters from the offices, I would see cement ramp and a sign reading, "Rampas Chico." I saw it and pulled inside the dirt lot. A man walked outside the house at the end of the dirt parking lot. He wore reflective police-looking glasses and a floral print, a rayon shirt with an orange-colored albatross skin belt and matching boots, and a black sombrero. He introduced himself as Chico. My contact told me, "He's a cool dude but *se va querer llevar contigo*," meaning that he'll poke and prod to get you to bend, but he's joking around. In reality, Chico was the only person I could trust, according to my contact. It was safer and cheaper to stay parked in Chico's dirt lot inside my truck than in a border town hotel potentially filled with unknown or unsavory characters.

Freighters rely on Chico to provide the ramps, and so do customers who wish to ship vehicle(s) inside Mexico. His large dirt lot allows customers to park overnight in the event that they need to wait for a trailer. He asked about my items. Explicitly, he told me that there was no shipping drugs or guns without declaring upfront. Chico stood a few feet away as I sat in my truck. After he engaged with his two cell phones, he told me how it works: I would pay the owner of the *rampa* a hundred pesos for finding a driver, then I would pay the trailer driver for his freight service, and a *rampa* fee at the destination for unloading. If I needed to stay overnight to wait for a freighter, I should expect to pay about 100-150 pesos per night. Fortunately, I didn't need to wait too long because there was already a driver adjusting his trailer hitches. The driver was going to Los Mochis, Sinaloa, eight hours shy of my destination. I took it and paid Chico his fee before he could get edgy on me.

The driver, hereafter known as Chofer, and his son, Alex, were a joyful father-and-son team. Chofer is a hefty man in his 60s, and is 28 years old and an apprentice on this trip. Chofer schooled me about my rights as a driver in Mexico. His son was attempting to attain an international driver's license for commerce like his older brother, who lives in Arizona.

Chofer insisted that any level of authority or highway patrol does not have the right to search or otherwise to impede or ask for a bribe when all paperwork is in order. Thanks to his freighter service, I avoided paying rampant bribes, a common practice for all authorities that I would have encountered had I attempted to drive on my own: *fiscales* (customs officials); military personnel; federal, state, and local

police. He reached over to the map pocket of the door to grab my truck's paperwork and raised it in the air to declare, "Don't let them coerce you into bribing them. That shit is illegal." He made the last eight-hour leg where I'd be driving by myself feel better. Our agreement was from the border to Los Mochis, twenty-two hours. I passed over twenty checkpoints with his service paying for gas and wear and tear on my truck while I could sit back and even lie on the bed if I wanted.

Chofer told me a story where he once stopped state police from harassing a woman driving on a federal highway. He walked up to the police and gave him a verbal citing of ethical conduct while interweaving federal highway laws. He described the officer walking away with his head between his legs, and the driver thanked him.

Driving from California to the Sierra, I passed multiple borders marked and imagined. Chofer and Alex helped me pass the most dangerous portion of the northern desert region where *narco* groups and authorities regulate every nuance of geographic space along highways. At one point in the middle of the night, Chofer woke me up to let me know we were entering a hot zone where it was dangerous to drive at night. Chofer is on payroll with an agricultural freight company, so his plates and license to drive are federal issued. His status supersedes state, and lower authorities' ability to shake him down. He also explained that *narcos* invest in the agricultural industry and extort large corporations like those that hire him. But, if there *were* a heist, he explained, the trailer has a GPS making its location visible to dispatchers. They would know precisely where we disappeared on a map.

In total, I spent twenty-two hours in the trailer. For the remaining eight hours to Guadalajara, Chofer insisted that his son go with me. He convinced Alex to deboard and ordered him to bring back the famous three-foot French breads sold outside the old bus depot. After arriving, I drove him to complete his errands and then to board a bus back to Los Mochis. I then went to my relative's house to rest. The next day I awoke at 10 AM to the news of fire blockades, burnt cars left by a *narco* group, in the main highways entering the city of Guadalajara, precisely the route we took to enter Jalisco's state from Los Mochis. All other border highways were targeted, according to reports. It seemed that a *narco* group was retaliating for the capture of one of their leader's sons. So, they left vehicles torched. Seven people dead and fifteen injured. It was all over national news on TV and online, "*Arde Jalisco: 39 bloqueos en 25 municipios; 4 enfrentamientos [confrontations], 7 muertos y 115 heridos*" (Redacción AN 2015). I thought of Alex. He should have made it past those blockades and home by the time this happened. Indeed, he called me later to confirm that he was ok and made it before the violence occurred. I rested for several days in Guadalajara while I waited for Totopika and his son to meet me there as they had arrived by bus earlier in the week. We planned to drive to the Sierra together in my truck.

Building Rapport in the Sierra

It's not uncommon to get approached by locals who won't hesitate to check an outsider about his business in their community. "*Who are you?"* Or, "*Why are you*

here? *Who funds you*?" I was always with at least one member of the families I'm staying with, either the Garcia or De la Cruz families. The heads of the Garcia family, Totopika and his wife, are currently serving a prestigious position in the religious temple in Nueva Colonia. I've known him over a decade. I've known his cousin and head of the De la Cruz family, Rojo, for twenty-five years. Both Rojo and Totopika vouched for me as soon as I arrived. They spoke with their relatives and local authorities about my stay and their assurances helped to assuage any aggressive locals if ever I was in public by myself.

In one instance, while at an event in the central meeting place in Nueva Colonia, I had driven Totopika to an event where a pig was going to be deep fried. It was sponsored by the local ruling party, the PRI, *Partido Revolucionario Institucional* (Institutional Revolutionary Party). I told him that I don't eat pork, so I stayed back observing from my truck, and in a gesture of tremendous confidence, a man approached me and put his arm around my shoulder. He managed not to come off aggressively, but it certainly got my attention. He said, "People have been talking. I'm not one to talk, but…." In my mind, I imagined so many ways this conversation could go with concerns that he would confront me about my presence. I reminded myself to remain calm. He continued, "…Talk is you're a *masajista* (massage therapist)." I kept a poker face, but inwardly I was laughing and perplexed. What could this assertion possibly be about? He continued, "My wife has a problem on her leg, and I think you could help her." My mind played out scenarios of things I had done since I arrived to possibly explain this assertion, but I drew blanks. I told him,

“No, Sir. I’m not a massage therapist. Someone is spreading rumors.” He wouldn’t accept it. He insisted that I help his wife. A few days later, I mentioned it to Totopika, and he confirmed it was one of our neighbors. The association made sense now. Since my arrival, I made a salve for my bodily aches while driving long hours to get here. Then I noticed Totopika’s leg was inflamed from the hip surgery. I offered to massage with the salve on his crusty looking skin, inflamed and almost dry-cracked. He felt better almost immediately and gained slightly more movement in the leg with less pain. Naturally, he mentioned it to the neighbor.

The neighbor must have been Totopika’s contemporary in his sixties. His wife, perhaps in her fifties or sixties, also, walked with a limp about the property as Totopika, the neighbor, and I walked in. We’re in the open patio sitting as the neighbor’s wife joins us. She approaches while wincing and sits in the only empty chair across from me. “Some days, I can’t take the pain. Today is not so bad. I can do chores and make food” she said as she pulled her skirt up slightly to show me her right knee. Everything looked inflamed compared to the left side. I ask her some questions and try to get a sense of her illness narrative. “Does it hurt or tingle when I press my finger on your skin?” I asked. “Yes. It tingles.” She responded. I said, “Ok, I’m going to rub this medicinal salve on you. I use it for inflammation and to manage my muscle soreness and aches and pains.” She said, “It smells good. What’s in it?” She asks. Totopika replied, “Peyote.” Everyone laughed. The husband followed with a joke about how it would make her hallucinate and have visions of their culture hero, *Tamats Kayumari,* the Elder Brother Deer. We laughed some more.

Bodies tell stories about social suffering beyond the words people use to describe them (Kleinman et al. 1997; Scheper-Hughes and Lock 1987). The neighbor's wife spoke of her somatic pains and what she can do and not do. Totopika's body speaks of thirty years of serving positions in the temples of the Wixaritari community of Santa Catarina. His body also bears scars from working in the mines and a recent accident that required surgery on his hip. He uses crutches. He insists he is owed a pension from working in the mines. At first appearance, a streak of white hair flows down his forehead in an otherwise full head of black hair. If you ask him how he got his white-haired spot, he'll tell you about the time he went deer hunting. He carried the dead deer on his shoulders for miles, adjusting it as he traversed the forest, while blood dripped from the deer's wound to his head. Shortly after, a streak of white hair appeared that gave him his signature look. After massaging the neighbor's wife, Totopika, asked me to apply a salve to his leg. He had been in an accident, which I discuss later in this chapter.

Their bodies also tell stories of the foods being sold in the small stores around town: sodas, sugars, meats, and processed foods from the little stores in town. Doing bodywork enabled me to observe a deeper level of peoples' lives: how they wore the labor and how Nueva Colonia has aged during my twenty years of visiting, particularly with the influx of processed foods. The environment is wearing on their bodies. I kept thinking about how I'm in the Sierra where people are from the corn, but if I go to the small stores and look around at what is being sold, it looks like this is the land of the corn syrup. All the products being sold contain high fructose corn

syrup, high sodium, or products laden with agricultural chemicals. Does that make people's bodies more prone to other conditions?

The other stories that bodies tell are of poverty and discrimination, as this region is one of the most impoverished areas in Mexico. It's also a region racked by narco-violence as the Wixaritari territories intersect with opium production. Wixaritari see everyone but them making profit from their culture and the land resources they claim to rightfully own. However, while Wixaritari bodies may express economic disparity, these bodily traumas are compensated by a deeply rooted mandate to protect their vast territorial connection to their environment. My research findings suggest that their environment both helps them and condemns them. The burdens of poverty in addition to social and institutional discriminatory policies against indigenous people mean that people in this region of the Western Mexican mountain range bear an unequal burden of trauma and stress that results in "conditions of the poor" (Farmer 2004; Tsing 1993; Merrill Singer 1994). In a critical medical anthropology analysis, Merrill Singer introduced the concept of a syndemic in public and community health, which speaks to health outcomes being worsened by social processes and structural inequities (Merill Singer and Clair 2003; Merrill Singer 2009; Merrill Singer et al. 2017). Essential services are hard to come by and more expensive for poor people. Medical services, mechanical services, and supplying the household with food and water prove to be more work and more money and even more logistically challenging with any level of emergency. I observed people's daily stresses and anxieties as I became part of the rhythms of everyday life

of the families I stayed with and some of the locals when I provided either massage or mechanic services.

When a car breaks down in the Sierra, you have to recruit a mechanic from Huejuquilla two hours away. The mechanics charge for travel time. Having brought my truck and tools made it possible for me to be handy and service people in the Sierra. It allowed me to observe how people are mobile throughout the region and beyond. To fix someone's vehicle sometimes meant driving to their home or to town to pick up a part while I also gathered personal supplies. In this way, I was embedded in peoples' lives to solve their car issues that overlapped with their medical supplies and other household needs. Basic survival in everyday poverty often escalates minor emergencies as well as elevates stress and anxiety. Bodies wear these social conditions and processes over time. In this community those processes reflect the ongoing troubled relations between the nation-state and indigenous people. This relationship has an extensive history and is reflected in parallel with the history of anthropology in Mexico. As a burgeoning academic discipline, these relations drove the initial studies of anthropology and programs that are still in place today. The following section provides an overview of Mexico's relationship with indigenous people and anthropology's role in setting up regional centers toward that effort.

Indigenismo and Anthropology in Mexico

Anthropological investigations of indigenous people in Mexico in the post-revolution era were highly political and strongly connected with national integration.

Mexican anthropologists experienced limitations because investigations were sanctioned by the state through institutions that prescribed approaches that supported the state's politics. Beginning in the late 1930s, Mexico's policy of *indigenismo* established a series of governmental institutions to fund indigenous studies such as the *Sociedad Mexicana de Anthropología* (1937), the *Escuela Nacional de Antropologia e Historia,* ENAH (1939), and the *Instituto Nacional Indigenista,* INI (1948), with coordinating centers in various states. The purpose was to carry out anthropological and archeological investigations. Coordinating centers were established throughout Mexico's indigenous regions to execute investigations: in Chiapas the Tzeltal-Tzotzil center; in Oaxaca, the Papaloapan, Mazateco, Mixteco, Huautla, and Mixteca Alta centers; in Chihuahua the Tarahumara center; in Yucatan the Centro Maya; in Jalisco, the Cora-Huichol Commission that focused on El Gran Nayar (Caso 1958).

Studies in Mexico have been conducted either by Mexican anthropologists employed at state institutions or by foreign anthropologists. Cynthia Hewitt (1988) identified seven paradigms that characterize approaches in anthropological studies of Mexican Indian people: ethnographic particularism, functionalism, *indigenismo,* cultural ecology, orthodox Marxism, and dependency theory. Although Hewitt included *indigenismo* in her list of paradigms, it must be noted that the *indigenismo* approach was funded through national institutions with the ultimate purpose of serving the Mexican projects of constructing a national identity and integrating indigenous populations as subjects of the state.

Mexican anthropology consolidated in the 1920s. Manuel Gamio pioneered the *indigenismo* movement with his text "Forjando Patria" (1916), in which he proposed the ideal Mexican to be a mestizo produced from ethnic fusion. The idea Gamio proposed was to forge a fatherland by "incorporating" the indigenous people into the national project while introducing their virtues, esthetics, and symbolism to a national culture. José Vasconselos, the founder of the Ministry of Education in 1921, coined the term "the cosmic race," which built on Gamio's idea of mestizos as a national ideal. Alan Knight characterized the post-revolutionary time as "images and allegiances drawn from a (partly mythic) past which helped shape discourse, policy, and political affiliation" (1994:398). Guillermo De la Peña defined *indigenismo* as "an ideological movement that denounced the exploitation of aboriginal groups and strove for cultural unity and the extension of citizenship through social integration and 'acculturation'" (2005:717).

Most of the anthropological studies conducted by Mexican anthropologists in the post-revolutionary period were sponsored by two main institutions dedicated to studying the indigenous populations and implementing development programs: INI and *Instituto Nacional de Antropología e Historia* (INAH). In 1973, CIESAS (*Centro de Investigaciones y Estudios Superiores en Antropologia Social*) provided a third major center of research and higher learning as part of CONACYT's (Consejo Nacional de Ciencias y Tecnología) Public Centers System.[3] In 1950, INI officially established linguistic affiliation to determine Indian and non-Indian people (Caso

[3] https://catalat.org/publisher/ciesas/

1958). In addition to recognizing language, INI summarized general distinguishing characteristics of indigenous people in Mexico, including belonging to an indigenous community separate from the dominant culture and possessing different material, cultural, and spiritual customs (Caso 1958). Taken generally from synthesizing the literature, indigenous people in Mexico can be defined by speaking their language, practicing spiritual and cultural traditions within a cargo system that incorporate the agricultural cycle and to different degrees, Catholic ceremonial calendar holidays.

At mid-twentieth century, throughout the 1950s and 1960s, the anthropological approach was less about typologies of natives compared to non-natives and of self-contained communities and more about regional analysis and cultural ecology. This research still used a Marxist approach. For example, the work of Eric Wolf (1957) on closed corporate communities and peasant studies was highly influential in forming the ecological approach. Wolf (1957) viewed the relationship between indigenous communities and the larger society as interconnected, in which peasant households formed a "corporate community" in defense of a common territory. Aguirre Beltrán (1979) also saw indigenous communities as separate within a larger mestizo society.

Building on Wolf, George Foster (1965) introduced the concept of "limited good," the idea that peasant life is resistant to change because of the competitive struggle for little money, land, and goods that involved shifting patterns of alignment. In the 1960s and 1970s, studies were anchored in a dependency paradigm that generated questions concerning exploitation and its mechanisms. Guillermo de la

Peña (1981) disagreed with the corporate model of community and argued for an analysis that takes local conflicts into account and sees the local community in the context of regional and national oppositions and heterogeneity. He argued that the "structure of village life was contingent upon a set of changing circumstances in the wider society" (39). These included climatic and demographic conditions and variations in the need for labor caused by demand from European and national markets (de la Peña 1981).

During the 1970s and 1980s, Marxist anthropologists approached studies with an analysis of exploitation and class analysis in which many tried to theorize the class struggle of the native people (Bartra 1974; Aquirre Beltran 1967, 1979; Stavenhagen 1969; Warman et al. 1970). The implementation of anthropological research under the state gave indigenous people a political voice, albeit a controversial one, because *indigenismo* used the provisions and services of the agrarian reform for legitimacy (De la Peña 2005).

Indigenismo confronted its most resounding criticisms nearly fifty years later. Arturo Warman, et al. (1970) took Mexican *indigenismo* to task with their volume *De Eso que llaman Antropología Mexicana,* arguing the paradigm was complicit in the modernizing scheme of the authoritarian Mexican state and its failure to improve the lives of Mexico's indigenous people. According to Nolasco Armas (1970), *indigenismo* provided the necessary mechanisms to modify the indigenous population's material conditions and integrate them into the homogenous national culture. On the other hand, Armas pointed out a contradiction in the approach of

indigenismo because it tries to address exploitation and the unequal relationship between indigenous people and the nation-state, yet it intervenes solely in the indigenous world, thereby assuming the problem is only with the Indians and not with the dominant society. Its main proponents, Manuel Gamio and Gonzalo Aquirre Beltrán, garnered legitimacy through agrarian reform, rural education, and the liberal intellectual movement during the post-revolutionary era (Bonfil 1970). According to Bonfil (1970), Gamio wanted to preserve indigenous values but was not clear about how he could preserve them. Bonfil saw the goals of *indigenismo* as expanding the internal economic market by incorporating indigenous labor and consumerism while integrating rural sectors that had been "regions of refuge."

The first ethnographies to focus on the Wixaritari (plural of Wixarika) were conducted in the late 1800s (Lumholtz 1895; Diguet lat 1890s). Léon Diguet, in the late 1890s, focused on Wixarika myths and language in addition to the chemistry of plants and geology of the natural environment. Lumholtz's work, entitled *Symbolism among the Huichol Indians* (1900), focused on describing the objects and ideas surrounding rituals with a symbolic approach. Lumholtz's symbolic approach influenced later anthropologists who studied the Wixarika, focusing on their beliefs and customs (Zingg 1938/2004; Furst 1996; Fikes 2010; Rojas 1993).

Unfortunately, the symbolic approach led to essentialist interpretations of Wixarika beliefs, thus rendering people as ahistorical. Much of the literature also assumed that Wixarika's geographic isolation was the reason for their lack of acculturation (Fikes 2011; Myerhoff 1974; Franz 1996). However, Allen R. Franz

argued that their strength and cohesion of sociocultural systems exist despite, and in some ways because of, their interrelations with other groups, both indigenous and non-indigenous (1996:63). Wixaritari, Franz contended, are a historical fluke ethnologically because their neighbors, the Coras, Tepecanos, and Mexicaneros have acculturated to a greater degree than the Wixarika. The latter are among "the least-changed peoples in all of the New World" (Franz 1996:64). The main reason for this is, ironically, that Wixaritari managed their relationship with the Spaniards such that they were able to keep their ranchos and *tukipa* (ceremonial centers). Meanwhile, the Coras, who held off Spanish invasion for longer, were eventually forced to abandon their original ranchos for Spanish presidios and towns adjacent to a church.

Anthropologist Nahmad Sittón countered some of the assumptions that construct Wixarika culture as static. He focused on the satellite community located at the base of the Rio Lerma. Wixarika migrated there after the Cristero War (1926–1929) disrupted the region. Sitton argued that even though some Wixaritari have moved away from, and have little contact with, central Wixarika communities, they have maintained their language and customs and Wixarika identity (1996:480). Similarly, Furst and Schaefer (1996) challenged the notion of an archetypical traditional Wixarika—one who doesn't leave his central community. They investigated urbanized migrants in Mexico City who have maintained their identity even though they have adjusted their lives to the urban social reality. They argued for a diversity of ideologies and narratives among the Wixarika. Fikes, Weigand, and Garcia de Weigand (2004) similarly argued that among the various Wixarika

investigations, not enough studies have focused on the nuances of ideological difference and language variation.

Despite Lumhotlz and Diguét's elaborate investigations, neither accompanied Wixarika on their famous pilgrimages, especially to the peyote garden desert of San Luis Potosi. The first anthropologists to conduct ethnographic work in a peyote pilgrimage were Salomón Nahmad Sittón, Barbara Myerhoff, Peter T. Furst, and Fernando Benitez 1968. These four scholars had varying stakes, but together, they piqued other anthropological studies about the Wixaritari. For example, Barbara Myerhoff's *Peyote Hunt* (1974) took a symbolic approach, building on Victor Turner and Levi Strauss, and argued that the pilgrimage brings together variations of meanings and paradoxical symbols to function as a single, sacred event that makes social life possible. Although her contribution to understanding the pilgrimage and symbols was insightful, it risked being outdated and essentialist because the study relied on a Wixarika who had moved out of the community.

Benitez's intervention was more polemic. He stressed the importance of not reducing Wixarika knowledge to the limitations of structuralism. One of the reasons he went on the pilgrimage was his concern with second-hand accounts about the Wixarika pilgrimage. He was disconcerted with Mexican anthropology's misrepresentation of indigenous people, specifically Wixaritari, as primitive, and as a consequence, scholars misunderstood native beliefs and way of life (1975:20). Finally, Benitez argues, "The alienation of such a large segment of the Mexican population is detrimental to the economy and progress of the entire nation" (32).

Salomon Nahmad Sittón's stakes were also political because, as director of INI in the region of Nayarit in the late 1960s, he was the intermediary between the government and the Wixarika. Nahmad Sittón offered three explanations for why Wixarika migrate to other parts of Mexico. One is to take advantage of the job market for unskilled agricultural jobs. The second is to deal with the scarcity of arable land, for as a people with an intense attachment to the soil, they are forced to find land elsewhere. A third reason is because of violent internal conflicts among Wixarika, who were affected by mestizos who invaded Wixarika hamlets during the Mexican Revolution and the Cristero War (1996: 490).

As an ethnographer, Nahmad Sittón responded to anthropologists, who promoted outdated descriptions of Wixarika that did not reflect their reality. Nahmad Sittón argued that not enough attention focused on how dominant society invaded and suppressed the region. The other critique Nahmad Sittón argued was that scholars should learn to appreciate the reality of the Indian intellectual and the Indians who migrate to the city but keep their identity. His argument responded to Melville Herskovitz's models of acculturation. Anthropologists such as Gonzalo Aguirre Beltrán (1979) borrowed from Herskovitz and argued that Indians who become educated and leave their home communities lose their identity. As Redfield, Linton, and Herskovits explain, "Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups" (1936:149). This definition presents culture as something that is left behind

and learned anew. It assumes that Wixarika culture is static and able to be replaced writ large. Meanwhile, anthropologists have argued for the necessity of paying more attention to the political, economic, and social processes at work in mobile people's lives rather than overemphasizing the role of culture (Hunt, Schneider and Comer 2004).

Nahmad Sittón argued for a Wixarika notion of territoriality to espouse a perception of sovereignty within the nation-state. For Nahmad Sittón, the major stake for Wixarika is the differing relation to the land. Wixaritari attach notions of spiritual tenets and stewardship to the land, while the state is stuck on a colonial idea of extraction and profit (1996: 470). His larger argument is that Wixarika face religious, state, and mestizo pressures simultaneously. The church interferes with its religious beliefs and practices of patronage (475). Nahmad Sittón is speaking generally about the church, but the Jesuits, Franciscans, Catholics, and more recently evangelical groups have engaged the Wixaritari to varying degrees in violent conversion, from setting up churches in their communities to their role in colonial labor. The modern Mexican state interrupts Wixaritari judicial organs and jurisdictions. All these attempts are to create a national culture by erasing the Indian as it assumes that the nation-state has the right to enforce acculturation and assimilation, which undermines the legitimacy of indigenous forms of governmental institutions.

Another source of pressure comes from mestizo ranchers. Ranchers are stuck in the colonial era construction of a rural civic society that sees the lands owned by Wixarika as objects of exploitation. Over the years, ranchers have foreclosed on

Indian territories (1996: 474). The process of reducing native lands to ranching and logging happened with each regional development program of the Mexican state, from the 1950's onwards. I discuss the specific programs in Chapter 3. To Nahmad Sittón's analysis, I would add that a fourth actor is encroaching: transnational corporations that have partnered with the nation-state for resource extraction projects such as mining, logging, and agribusiness.

Anthropologist Paul Liffman (2011) used territoriality as his central framework for two reasons. First, it helped him look beyond official spatial categories where Wixarika are only partial citizens and claim partial sovereignty over a vast area. Second, he wanted to highlight the discursive notions of territory versus the traditional geographic ones (5). Liffman demonstrated that Wixarika ceremonial territory represents an alternative model for the Mexican nation's organization that is based on reciprocity, stewardship, and the reproduction of culture before capital (15). Liffman used the idea of reterritorialization to discuss how urban Indians restructure communal space and institutions in urban niches (37).

Project Background and Location

Wixaritari inhabited their current space long before colonial times. Currently half of the 45,000 Wixarika reside in three to four main temple communities and surrounding periphery hamlets, each with their own set of administrative and governing bodies. In total, they cover over 4,000 square kilometers of territory (Liffman 2011). The other half have migrated to places such as Mexico City,

Guadalajara, nearby agricultural areas like Fresnillo and Nayarit, satellite communities in the Sierra Madre foothills, and most recently, the United States as migrant workers.

Each of the main communities contains separate smaller hamlets or villages with their governing councils that appoint civic, religious, and agricultural *cargo* appointments. Cargo appointments are served from a few months to five years, depending on the position. Positions are divided into the three categories of Wixarika life: ritual, civic and agricultural. From the federal government's point of view, Wixarika are divided into *ejidos,* a post-revolution legal form of communal land ownership imposed by the Mexican state. Communal lands, and their communities

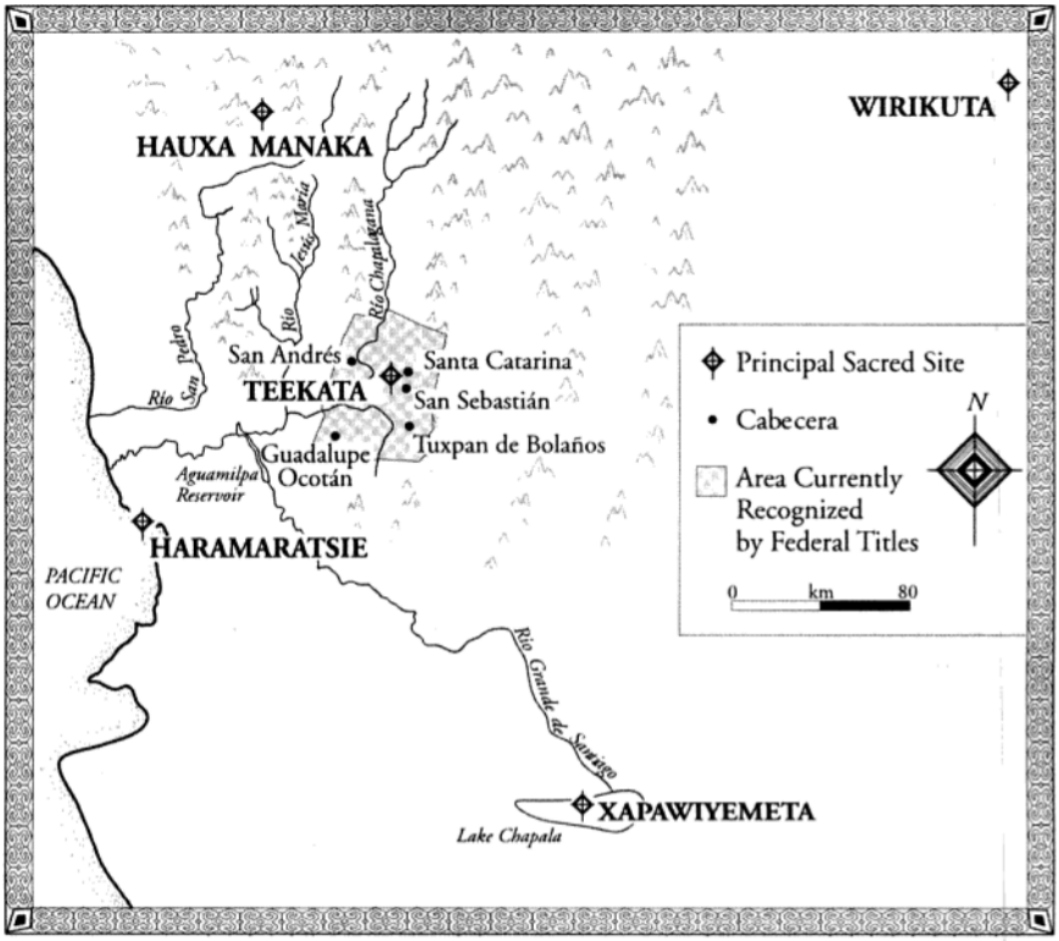


Figure 3 Wixaritari cabeceras in shaded area. Map by Susan Alta Martin from Journal of the Southwest 42:1 (Spring 2000:44).

belong administratively to the jurisdictions of three Mexican municipalities. This is important because, although Wixarika govern themselves independently as *comunidades indigenas* (indigenous communities) and believe that they should have full charge of their own lives, the political and economic reality is that they are under the administrative control of non-indigenous municipalities, three federal states, and ultimately the nation-state (Nahmad Sittón 1996).

The last point warrants an unpacking of the dialectic relationship between indigenous people and the state. Marisol de la Cadena (2010) defines modern indigeneity as a "partial connection" between two ontologies of sovereignty and political agency. On the one hand, an important factor for state hegemony has been the government's capacity to define what it is to be indigenous, including the identity and political conditions that emerge through their integration into the nation (de la Peña 2005). "There is no single group of isolated indigenous people: all are exploited for the benefit of the nation" (Bonfil 1970:43).

Indigenous people want to be included in the Mexican nation's discussions about resource management as *la consulta,* the idea of consulting with native people, when dealing with projects on native territories. An example is the 2008 Huaxa Manaka Pact that established federal and state recognition and protection of ceremonial territories for the preservation and development of Wixarika customs and practices signed by the *Union de Wixarika de Centros Ceremoniales,* Wixarika Unions of Ceremonial Centers, and the governors of the states of Zacatecas, Nayarit, Jalisco, and Durango. Yet, just as this pact protected cultural rights, their Wixarika land rights were undermined by the withdrawal of federal agricultural subsidies under the 1994 North American Free Trade Agreement (NAFTA), and the termination of agrarian reform under Article 27 of the Mexican constitution that had historically formed the foundation of Mexican nationalism and property (Ferry 2005; Liffman 2011). Wixarika responded by allying with non-governmental actors, drawing on international bodies such as the United Nations, and forming a social movement to

protect their sacred territories against mining, tourism, and other megaprojects across their sacred territories. Today, increasing religious persecution involves extractive ventures where transnational corporations partner with domestic companies and/or the government to conduct mining, logging, agribusiness, and tourism on ceremonial lands.

Wixarika cosmology or religious ideology is a multiplicity of male and female deities personified in natural forces, phenomena, and geographic landscapes. The several hundred deities have a home somewhere in geographic space that the Wixarika consider part of their ancestral lands. Wixarika have confronted religious persecution that began in the colonial era and that continues to this day. In response, they reformulated Catholic icons and rituals by adapting them into their symbolism and claiming them as an original Wixarika symbol that the Spanish stole from them (Nahmad Sitton 1996).

Beyond their mountain range, Wixarika navigate a larger ceremonial territory, the *Kiekari.* The *Kiekari* extends across ninety thousand square kilometers or and five Mexican states (Liffman 2011). The five points of the *Kiekari* are sites of past and present confrontations, with historical legacies of fighting for territorial rights against mining and other large projects sanctioned by the government. To the West in San Blas, Nayarit, ten of thirteen hectares of ancient ceremonial territory at Isla del Rey were recently given to a resort developer by the government (Pérez U 2014). To the East is the desert of San Luis Potosi, *Wirikuta*, where Wixarika and their allies are protesting an open-pit mine for gold and silver. In the last two years, Wixarika

rejected an offer of USD 3 million from a mining company that offered to purchase a mountain for a proposed uranium mine.

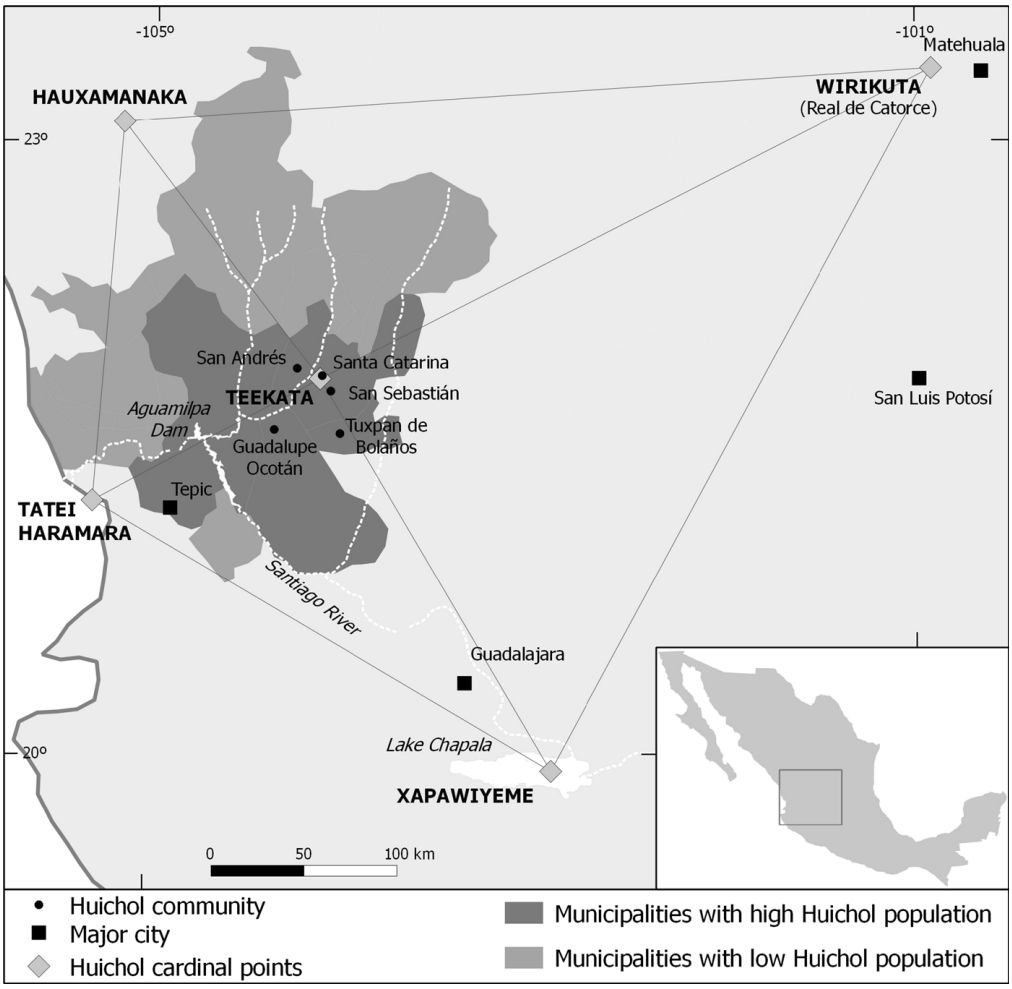


Figure 4 The main sacred sites of the Wixaritari territory: Hauxa Manaka in the state of Durango, Wirikuta in San Luis Potosi, Xapawiyemeta in Jalisco, Haramaratsie in Nayarit and the center, Te'ekata in Santa Catarina. Source: Lifman (2011) and INEGI (2009).

Anthropology doesn't escape Wixaritari purview regarding unequal benefit of extraction of cultural data. They have been the subject of anthropological studies for over 100 years. Their collective memory is keen on confronting researchers about their agendas and political leanings on matters of ethics and monetary gain. Although

I have trusted friends, and some consider me family, I was still confronted in moments and spaces about who funded me and what I was doing in their village. In some cases, it was out of genuine curiosity, but in others, the questions were blatantly confrontational. I had to deescalate the situation and identify my host families when needed.

In the tradition of anthropologists such as Sidney Mintz and Paul Farmer, a thorough understanding of the modern problems that plague indigenous people in the postcolonial situation must include a peoples' material context. They stressed that modern anthropology's interpretive work is in the context of a historical material understanding of the scales of social and economic structures. The emergence of pathologies, afflictions, and epidemics is a direct result of systemic vulnerabilities and racial categories (Farmer 2004).

The Battle of Attrition is the Battle of Nutrition

This dissertation's main research problem focuses on environmental triggers for the pandemic of metabolic syndrome cases in Nueva Colonia, Santa Catarina, and the nation of Mexico. I use the lens of environmental epigenetics that considers chemicals and foods as a molecularized environment. Epigenetics is defined as the study of changes in gene expression that occur both from the environment and from heritable triggers but that are absent of change in the DNA sequence. 'Epi' means 'above' the level of genetic sequence (Landecker 2011). "Nutritional epigenetics work focuses on molecules controlling gene expression or connections between molecular mechanisms to epidemiological correlations linking human nutritional

states with adult-onset diseases," such as metabolic syndrome (Landecker 2011:174). The molecules in food determine the kind and number of molecules attached to DNA, and these molecules determine the kind of body an organism will develop. "Metabolic syndrome is a cluster of signs that a systemic regulation has gone awry: raised triglycerides, lowered HDL cholesterol, raised blood pressure, adiposity at the center of the body, high levels of glucose in the blood after fasting" (Landecker 2011:176). Nutritional epigenetics recasts social suffering as epigenetic in nature because it contributes to higher risks in disease incidence such as diabetes (Landecker 2011).

Picking up on metabolic syndrome and social suffering, medical anthropological ethnographies have advanced the understanding of the social processes that produce or exacerbate conditions, especially among vulnerable populations. Alicia Galvez's, *Eating Nafta* (2018) argues that the North American Free Trade Agreement of 1994 caused Mexico's recent metabolic syndrome epidemic by altering ancient foodways with foods high in sodium and sugar imposing market-based consumer ideology. NAFTA significantly re-structured Mexico's economy, labor, and infrastructure. Subsistence economy, a feature of rural life in Mexico, was replaced with hyper-consumption as industries flourished with products addressing weight loss, fitness, and treating chronic illness (Galvez 2018:141). Meanwhile, the country reformed energy and privatizes aspects of life to private industry with minimal protections for labor or consumers. The nation's poor and indigenous bear the highest risk.

Similarly, Emily Yates-Doerr's, *The Weight of Obesity* (2015) looks at Guatemala's metabolic syndrome. A similar trade policy, CAFTA, the Central American Free Trade Agreement of 2006, also created major shifts in Guatemala's food supply. In both cases, market-based ideology disproportionately affected the poor and indigenous. Their lives, including their eating habits, became more individualized and fast-paced to support a lifestyle of constant migration for independent contract labor.

The studies above can also be understood with Harris Solomon's (2016) concept of "absorption" of illness. Solomon, who studies metabolic syndrome in India, argues that attention to absorption helps to take the gaze away from overconsumption as a starting point but to consider how people live daily life suffering while absorbing not just food but toxic chemicals, stress, and the trauma of poverty. Thus, metabolic syndrome goes beyond the digestive system to include how the body processes what is consumed and what is experienced that causes a physical and mental state of exposure (Landecker 2013).

State development policies rely on narratives to create the ideological underpinnings of the market. The extensive research of medical anthropologists Charles L. Briggs and Dr. Clara Mantini Briggs examines how media mobilize narratives, government and health entities to blame poor and indigenous populations, especially in illness events (Briggs 1997; Briggs and Hallin 2016; Briggs 2016; Briggs and Mantini-Briggs 2003). Briggs' work helps contextualize the power dynamic between development programs that address Wixaritari health and the

women participants they recruit to gather health information. The power dynamics are stark when state and federal agencies have technology and infrastructure yet insist Wixaritari women participants act as socially responsible consumers who are supposed to make healthy decisions to get their families out of poverty and into better health. His concept of "communicability" is about how constructions of race and health intersect (2005). I extend this concept to the Genomic Sovereignty Law of Mexico that intends to sequence the indigenous population's genetics in an effort to address the diabetes epidemic. Briggs argues that "the communicative process of gathering health and genetic information about vulnerable populations creates categories and positions people within those hierarchies" (Briggs 2005:282). Briggs and Mantini-Briggs (2003) show how various actors from media outlets to government officials racialize health information and perpetuate narratives that actually harm vulnerable populations, such as in the case of a cholera outbreak among the Warao natives of Venezuela.

In the following section, I describe the structural organization for the rest of the dissertation.

Layout of the Chapters

Chapter 1, "Environmental Epigenetic Triggers: Embodiment of Herbicide and Processed Foods in a Metabolic Epidemic in Mexico," begins with two stories from my fieldwork where my body reacted to the environment around chemicals and processed foods. Those experiences made me pause to reflect on the framework

necessary to see the landscape's toxicity as embedded in social and political processes. The stories also offer local people the language for conceptualizing toxicity and how it is part of their foodways. The chapter reviews the environmental epigenetic approaches in medical anthropology and nutritional epigenetics. The undermining of local foodways and agriculture by introducing global market agricultural chemicals and processed foods implies a whole set of arrangements between industry and government. One such arrangement is the North American Free Trade Agreement (NAFTA), which imported a diabetic epidemic with ripple effects in the Sierra through processed foods' bombardment. I outline the way Wixaritari have responded through direct actions to hold agencies accountable, while the Mexican nation's approach has been to partner with biotechnology to produce "ethnic remedies" using post-genomic technology.

Chapter 2, "Wixaritari Cargo System and Muvieri Healers," is about Wixaritari care and governance of each other and their landscapes via their cargo system of hierarchy. I review the literature on cargo and put it in context with how Wixaritari use it to protect their sacred geography from further destruction. The chapter connects landscape practices with bodily practices of healing by presenting a healer's life history and his role within the cargo system. Through this chapter, I demonstrate how a relationship with the landscape that includes embodying a cosmology is implied in healing.

Chapter 3, "Love Spells and the Green Revolution," describes the social processes that I contextualize as part of the biological processes associated with

toxicity. In other words, this chapter is about the material history of how chemicals and processed foods were introduced through development programs and the way Wixaritari have organized to address and confront these social processes.

Summary

One of the major contributions of the critical medical approach to understanding health problems is the importance of understanding political economic influence on health inequities, disparities, and access (Baer, Singer, and Susser 2013). This approach helps interpret how life decisions are limited by sets of relationships that construct a material reality. For example, indigenous people occupy a certain relationship concerning the nation, the state, and neighboring mestizo towns. The social relationships treat Wixaritari as lower class. A Foucauldian approach is also instrumental in showing how immigrant health problems (such as increased asthma among immigrant adolescents, infant mortality in the farm fields, respiratory issues) are not attributable to cultural factors. Instead, one must be attentive to how systemic inequities, particularly the distribution of disease, contribute to violence and suffering (Farmer, Connors, and Simmons 1996).

In addition to the above perspectives, there are also the views and language of the people being studied. Thus, how local people conceive of sickness and how they foresee the alleviation of conditions through various healing modes becomes a critical data point to consider how people address the ailment and potentially the causes of sickness. For instance, is the sickness approached individually or collectively?

Market-based approaches to medicine have increasingly taken the form of individual or self-care. Yet, I present the case of the Wixaritari, where care for each other and their landscape is collective. While medical pluralism is practiced among the Wixaritari, in Nueva Colonia they practice deep-rooted cultural medicine that is not disconnected from their landscapes. The *mara'akame* is the traditional doctor whose medical ways are sourced from the landscape. Healers are made explicitly by registering at the sacred sites. Their life purpose is to achieve high levels of knowledge and medical power. Explicit in their life work is ensuring their sacred sites remain to continue their way of life and maintain the balance of the Earth and the universe as they see it in their ancestral cosmology. Thus, in rituals and family fiestas as in everyday life, the healer connects bodily manifestations of sicknesses to spiritual sources of pain or trauma—the realm a *mar'akame* navigates with the help of a magic wand, a *muvieri.*

My study examines social medicine by way of critical medical anthropology as a sub-discipline of cultural anthropology. It takes seriously how people conceive of sickness and healing. My objectives are to demonstrate how larger social, economic, and historical forces both impinge upon indigenous peoples' rights to land and local practices and implode at deeper levels – specifically at the genetic level. I look at phenomena from the molecular interactions of toxic chemicals related to historical and current traumas. Wixaritari history has shown their continued resistance as a collective enterprise. As the pressures have morphed into varying actors and mega projects, so have Wixaritari strategies to address their grievances shifted from local to

international platforms. Besides the organizing of marches, surveillance committees for sacred sites, press release round tables, and road-blocking elections in their territories, among other tactics, Wixaritari provide a nuanced case for how we might consider healing and medicine to address historical trauma and current stresses of everyday life. My argument is that songs and dance and the arts mediate the Wixaritari relationship to the spiritual world and put people outside of the capitalist world. And since their spirit world consists of physical geographic landscapes, their spiritual ceremonies combine the arts and engage their physical world to heal and transform peoples' lives. Many of my friends express a sense of purpose and, I would add, their purpose is in a world beyond capitalism, outside of the pain of living in poverty, of requiring material goods just to make ends meet, and outside of a world where they are constantly bombarded with the threat of losing land, sacred sites, and their way of communal prayer.

I argue that if we see chemicals as cultural objects, they are not absent of cultural behaviors. The use of chemicals in the environment and internalization via consumption or absorption into the body as biological end points illustrate how cultural behaviors are also corporeal. This is precisely where the personal becomes political (Rapp 2004, 2012), reflecting epigenetic warfare of the smallpox blanket variety. Environmental epigenetics provides a framework for understanding toxic landscapes and food systems as molecularized forms of embodiment. Racial politics plays out at the level of disproportionate risk to genes, as both informational and

biological endpoints. A war is diffuse and all-encompassing, and in the case of metabolic syndrome, it is substantive and somatic.

Chapter 1: Environmental Epigenetic Triggers: Embodiment of Herbicide and Processed Foods in a Metabolic Epidemic in Mexico

Mata Gatos (Killer Cats): Embodied Herbicide

A couple of acres of recently planted corn flanked the adobe rooms and open-air patio where we ate our daily bread. The youngest son, Roti, prepared herbicide and filled the spray packs near the cat's bowl and left it there overnight. The next day, he and his mom sprayed a section closest to patio. The cat must have gotten toxic shock; gaunt and frail, eyes bloodshot, mouth-frothing, and moving as if every stride hurt, it was taking its last steps in the dirt patio while we ate breakfast in the patio. "That's why we call it *mata gatos*," (cat killer) *Totopika* (Singer of the Sacred Songs) said. He was referring to the local vernacular term for herbicide. The area Roti had sprayed became a dead zone after just one day. There were other areas left to spray. I estimated two more days to cover the entire family plot that flanked the patio. I was certain that I would get some sort of toxic shock if I stay there longer. The waft of the weed-killer odor already made my throat parched and my head numb.

Totopika was a passenger on a bus that flipped over in 2014. Doctors inserted a metal plate over his hip to help it fuse. About four months after surgery, Totopika leans on his crutches upwind and instructs his son, Roti, and his wife,

Micaela, as they spray herbicide over the three-acre home plot. They're all wearing open-toed huaraches. Roti's loose-fitting calico pants and Micaela's ankle-long dress get snagged by the sharp weeds. Roti's toes hang over his huarache's ledge, making contact with the earth each time he steps his ever-growing teenager feet. They wore bandanas as face masks, merely symbolic, I thought, thinking of the full-body lab suit required when handling herbicide as per the picture on the poster at the store where we bought the chemicals.

Totopika is planting late this year. The weeds are overgrown, and they'll require more herbicide to eradicate them. The alternative is to pull them by hand but it's about three acres. Recent studies on herbicides show that years of spraying makes weeds resistant and they require more concentrated doses to eradicate. The problem with biocides compounds the difficulty of growing food because of the high cost of inputs and the precariousness of using something that is designed to kill one plant organism that is adjacent to other plant organisms. The safety and health issues of exposure are salient as farmers have a greater likelihood of developing brain, skin, and prostate and breast cervical cancers, leukemia, non-Hodgkins lymphoma and other ailments than the general population (Pellow 2007). Several weeks later, *Totopika* asked me a haunting question, "Why do you think it takes my son, Roti, so long to answer me when I ask him something? It's like he's not hearing me, but I'm right in front of him? The neighbor's kid is Roti's age, but he's active and more *prendido* (turned on). What do you think is wrong with him?" Totopika asked me. "Maybe it's because his brain is developing," I responded.

To be fair, a causal relationship between spraying and Totopika's question about his son's lack of response is difficult to pinpoint. It was much easier to relate to my bodily reaction: dry throat and light-headedness. I wondered if I was experiencing a type of toxic shock. Meanwhile, I'm sure they felt similar physical responses but worked through the sensations as normalized experiences of hard labor tending to their lands.

Maruchan Devils: Embodied Processed Foods

One of my contacts shared a local parable about how the introduction of beer ruined the community. In the story, a man has a conversation with the devil, and the devil is beer. Maruchan is the company that makes Cup'O'Noodles instant ramen in a Styrofoam cup. "This is a commonly circulated story, but it has recently changed." Paulino talked as we traversed for 4 hours in the hot, humid single-track trails from the cliffside of Rawepa to the canyon village of Taimarita. Paulino continues, "Now, the man is having a conversation with the devil, and the devil is Maruchan. It's eating our community from the inside out." This vivid insight floored me. He was speaking directly to my embodied experience. I flashed to a week ago when I hurled a Cup'O'Noodles that I ate for dinner after helping a man fix a truck in the village of Pueblo Nuevo. After dinner, I felt nauseated, and when I went to lie down, my stomach churned. I got up immediately, exited my tent, and walked to the edge of the patio to throw up. In the darkness, I could see the noodles on the ground almost glowing in the dark as the remains indexed the culprit of my bodily reaction.

Figure 5 Maruchan brand instant ramen noodles. Photo by author, 2015

I asked Paulino to elaborate as we slowed down a bit in a flatter part of the meandering trail. “Our traditional foods are being replaced by processed foods.” He continues. “Instead of sowing the land, we’re buying foods and drinks that contain toxic ingredients at these local stores.” The local mini-stores are partnerships with local women and the Commission on the Development of Indigenous people (CDI—Comisión Nacional de Desarrollo Indígena). The conclusion of our conversation rested on the word development that Paulino replaced with “destruction.” He made the point that the government-sponsored stores must be prohibited by contract from selling locally-made things because they rarely sell anything Wixaritari makes. The prominent companies represented at the government-sponsored stores are the global and national conglomerates of Coca-Cola, Nissin, Gamesa, beer companies, and large

agribusiness fruits and vegetables. Maruchan remains the devil because people in the Sierra live on less than USD 1 a day (about 18 Mexican pesos), while a Cup'O'Noodle in the Nueva Colonia costs 55 cents USD. Cheap processed foods and high fructose drinks represent a food system premised on individual transactions, procurement, and the general food experience.

Moreover, food is only one factor; though essential, researchers have proposed metabolic syndrome as a general concept to describe a bodily state and the increased risk of type 2 diabetes mellitus, obesity, and cardiovascular disease (Solomon 2016). In terms of the bodily state, ethnographic research has pointed to the trauma associated with migration, violence, rape, and adverse results of excessive allostatic load experienced as a result of the conditions of poverty and policy which reduced the viability of local food systems (Gálvez 2018; Yates-Doerr 2015; Pilcher 2017). Metabolic syndrome is an invisible killer of the Mexican population as diabetes has become the leading cause of death among adults (González-Villalpando et al. 2014). Paulino describes instant noodles as the devil because of local cosmology around food systems. Wixaritari believe their foodways were given to them by their deities in exchange for venerating them with songs, dances, pilgrimages, and arduous and elaborate ceremonies. Conversely, mestizos deserve inferior corn because they got lazy and stopped venerating the landscape deities.

Toxic Landscapes: Embodied Herbicide and Processed Foods

The toxic shock from agrochemicals and an adverse reaction after eating sodium-laced instant ramen noodles made me reconcile my bodily exposure to the environment and reconcile the response in unexpected ways. It altered my research perspective. I needed something that helped me contextualize the biological processes and the social processes that render an environment toxic. What sorts of social processes brought us to this intersection of toxic land and food? This research intends to address that question by focusing on foods and agricultural chemicals. It may be enticing to consider the prospect of higher-yield and faster foods for growers. I kept wondering, however, how chemicals and processed foods became the norm and under what conditions.

Furthermore, once the substances are present for generations, what sorts of biological processes can be implied as incorporated into bodies and lands? What social methods locally get altered to make chemicals and processed foods part of daily life and part of the culprit of a local problem that requires direct action? These are the central questions that an embodied ethnographic approach forced me to consider. Specifically, I began to look for a framework that would help me address these questions and the things I experienced while reflecting on the various scales of what I observed: biological processes and social processes of toxicity in the body and the landscape.

I knew precisely why I was sick. The experiences made me pause to rethink the underlining topics of my research to a larger question of health and wellbeing in

the context of toxic environments. Beyond food poisoning, local people were more concerned with protecting their way of life from destruction while also contending with toxic landscapes and their sicknesses. How are we embedded in broader social and political processes happening on the state, national, and global scales? I also needed a framework to consider the toxic chemicals that Wixaritari were subject to in terms of their bodies and landscapes. How are they fighting to protect their sacred sites from the destruction that includes development programs, mining, a toxic waste dump, and violent land disputes?

Reacting to the environment with my body and traveling with my contacts through the landscape made me see the diffuse nature of chemical toxicity. "Agricultural production of food and animal livestock carry persistent organic pollutants (POPs) that are toxic chemicals that remain in ecosystems for lengthy periods, travel long distances, and accumulate in the food chain" (Pellow 2007:158). In conversations with Wixaritari and participating in their regional community meetings, sacred site demonstrations, press events, and cargo rituals, I got a sense of the language they use to describe the perceived sicknesses on their bodies and their land: an infection that spreads. Especially in more intimate conversations, locals would describe violations on their sacred sites regarding disease done to the landscape reflected on their bodies. Similarly, I viscerally experienced a type of toxic shock. As a researcher, I juggled an act of interpreting both my own bodily experience to the ones my local contacts described. As a research method, transcendental phenomenology (Merleau-Ponty 1962) is a way to understand research

subjects' affairs with attention to the meaning of events based on how those events cause sickness, and I will elaborate that perspective in the next section.

Meanwhile, I interpreted my own experience of sickness using the hermeneutical phenomenological framework (Merleau-Ponty 1962) premised on the researcher interpreting his own experience. In both endeavors, embodiment's idea helps to interpret how humans experience the world through their bodies (Merleau-Ponty 1962; Husserl 1982). Moments when my body went into sudden rashes, difficulty breathing, vomiting, dizziness, for example, became forms of data. As previous anthropologists have used the concept of embodiment, I interpreted those moments as discursive sets of corporeal triggers as data (Holmes 2013; Krieger 2005). For example, Seth M. Holmes (2013) studies migrant labor structure along racial and ethnic categories in California and Oregon's agricultural fields. He participated in farm labor and crossed the US/Mexican border with his interlocutors. “My bodily experiences lent valuable insights into social suffering, power hierarchies, and the implications of field work relationships” (2013:34). On the first point of the researcher's relationship to subjects, Holmes's work informed me of my social class privilege compared to my interlocutors. Suppose we are to take equity in health seriously. In that case, we must keep in mind the larger point of unequal risk of toxic environments. While I do not return to an exposure-free climate after fieldwork research, my way of life is not threatened with violence, and my homeland is not being threatened like that of the Wixaritari.

While conducting fieldwork an embodiment methodological approach is central to epidemiological inquiry. According to Nancy Krieger embodiment underlies three claims: “one, bodies tell stories that cannot be divorced from the material reality of their existence; 2, bodies tell stories that don’t always match people’s stated accounts; and 3, bodies tell stories that people cannot or will not tell, either because they are unable, forbidden, or choose not to tell” (2004:350). The pervasive threat of everyday exposure, the increased risk associated with being poor, indigenous and vulnerable, coupled with the risk of threats of violence and land dispossession, are triggers that environmental epigenetics brings to bear as factors of adverse health outcomes. In what follows, I examine how the study of epigenetics evolved from theoretical frameworks among biologists to genomic and clinical research. The context for this story is shared by STS scholars such as Erik Peterson, Hannah Landecker, and Kim Tall Bear. I also address how this concept is engaged by medical anthropologists such as Margaret Lock, who proposes a post-genomic examination of the body that offers significant frameworks to understand the intersections of toxicity in land and bodies.

Epigenetics

Erik Peterson’s work tells the story of epigenetics emerging from the collective work of embryologists who formed their splinter group and formed the Third Way in biology (2016). In the mid-1930s, Conrad H. Waddington wanted to change the term ‘experimental embryology’ to ‘epigenetics’ (Peterson 2016:172).

Joseph Needham had written about ‘epigenetics’ or ‘epigenesis’ before Waddington (Peterson 2016:172). Joseph Woodger published work earlier that mentioned the term (Peterson 2016). All three were embryologists studying the link between genetics and embryonic development. The Biologist Club meetings tabled the topic of epigenetics (Peterson 2016). They saw it as a term emanating from Aristotelian times having the meaning “‘the causal aspects of development” (Peterson 2016: 172). Waddington received the majority of the credit with his work on ‘epigenotype’ (1942) and the concept of ‘the epigenetic landscape’ (Lock et al. 2015:152). This concept of epigenetics facilitates the Third Way or alternative theoretical framework for developmental biologists. The Third Way is the source of the concept of epigenetics that emerged from one of the earliest debates about whether and to what extent environment influences embryonic development. The Third Way was a splinter group of embryologists who argued for the concept of epigenetics because they wanted to establish environmental factors as influencing embryonic development. The debate continues with the example of the genomic sovereignty law that Mexico passed. Genomic sovereignty involves private interests and biotech firms (of the global North) partnering with nation-states (of the global South) to sequence peoples’ genes with the purpose of finding genetic endpoints to develop “ethnic remedies” to curb diseases, in this case, the diabetic epidemic in Mexico (Benjamin 2009; Schwartz-Marín and Méndez 2012).

Epigenetics needed more time to become a widely used research tool. According to Peterson, epigenetics “began to take off during the stem cell debates of

2001, then after the Human Genome Project (HGP) completed in 2004" (2016:252). The year the HGP was completed, Weaver et al. (2004) published a study that showed differences in DNA methylation (epigenetic changes) based on rat mothers who did or did not groom and lick their offspring. The research was ground-breaking because it showed a reversal in the epigenetic state associated with stress response indicators by taking non-groomed offspring and cross-fostering them into adulthood (Weaver et al. 2004). Essentially, it showed that "offspring of more 'attentive' rat mothers (those that frequently nurse, groom, and lick their pups) become adults with lower glucocorticoid levels, less anxiety, better learning, and delayed brain aging" (Sapolsky 2017:208). Subsequent studies (Moshe Szyf 2009; Champagne 2008) provoked the social sciences to respond to the environmental turn in life science regarding its social implications (Landecker and Panofsky 2013).

The definition of epigenetics varies depending on the era and the disciplinary literature[4] (see table 1). Early work in epigenetics was mostly dealing with development (Peterson 2016). For this chapter, I will focus on how biologists and social scientists engaged with the concept of epigenetics after the completion of the Human Genome Project (the 1990s - 2000s). In general, epigenetics moved beyond a mechanism of (embryonic) development to gene expression (Peterson 2016; Landecker and Panofsky 2013). The part where the environment comes in answers

[4] For an historical account of the concept of epigenetics see Erik L. Peterson's *The Life Organic: the Theoretical Biology Club and the Roots of Epigenetics* (2016).

"how genetic material is activated or deactivated—that is, expressed—in different contexts or situations" (Moore 2015:14).

Classical Definition	
"We certainly need to remember that between genotype and phenotype, and connecting them to each other, there lies a whole complex of developmental processes. It is convenient to have a name for this complex: 'epigenotype' seems suitable."	Wadington 2012[1942]
Revival of Classical Definition:	
"The study of the properties of the pathways and processes that link the genotype and phenotype."	Hallgrimsson and Hall (2011)
Molecular Definitions	
"The study of mitotically and/or meiotically heritable changes in gene function that cannot be explained by changes in DNA sequence."	Riggs et al. (1996)
Emphasis on Expression Potential:	
"The study of stable alterations in gene expression potential that arise during development and cell proliferation."	Jaenisch and Bird (2003)
"Epigenetics encompasses heritable changes in gene expression potential."	Waterland and Michels (2007)
Emphasis on Latent Effects:	
"Any long-term change in gene function that persists even when the initial trigger is long gone that does not involve a change in gene sequence or structure."	McGowan and Szyf (2010)
Consensus Definition of Cold Spring Harbor:	
"An epigenetic trait is a stably inherited phenotype resulting from changes in a chromosome without alterations in the DNA sequence."	Stowers Institute for Medical Research (2009)

Figure 6 Alternative Definitions of Epigenetics (Thayer and Non 2015: 726)

From a biological perspective, epigenetic inheritance is defined as "heritable changes in gene function that cannot be explained by changes in genetic sequence" (Goldberg, Allis, and Bernstein 2007:17). Epigenetics has also been defined as a cell's imprinted memory of past environmental events or developmental cues (Landecker and Panofsky 2013; Bonasio et al. 2010). In essence, "the explanatory logic of environmental epigenetics depends on tracing the impact of environmental factors on molecular processes, then the ensuing shifts in gene transcription and translation, and then the subsequent physiological or behavioral changes" (Landecker and Panofsky 2013:339).

Environmental Epigenetics in Medical Anthropology

The work in medical anthropology that engages environmental epigenetics utilizes this concept as a lens onto chemical toxicity and the implications for adverse health outcomes (Shapiro 2015; Roberts et al. 2008; Langston 2010; Murphy 2006). Medical anthropologists have also cautioned against a reductionist narrative, preferring one that includes how local people resisted throughout time and space the very forces that produce the chemical regimes that afflict the environment and threaten native bodies (Murphy 2017; Lock et al. 2015; Tallbear 2013). The critical part is that bodies tell stories about our existence's social conditions (Krieger 2005). Since anthropology is interested in how environment shapes bodies, "epigenetics represents a literal biological mechanism of embodiment" (Thayer and Non 2015). So, environmental epigenetics has been useful in accounting for social and racial inequalities that contribute to adverse or unequal burdens of disease and health outcomes (Kuzawa and Sweet 2009). Two directions of inquiry may follow from here: First, a word of caution as others have pointed out the dangers of perpetuating "deterministic and potentially stigmatizing perspectives" (Müller et al. 2017:9). Secondly, it is not enough to include the forces that contribute to toxic environments but imperative to fit the way local, regional, or international efforts have organized to address those forces.

Environmental epigenetics studies have taken on four main avenues of research: life course (parental exposure and maternal rearing), social deprivation, food as environment, aging, and exposure to toxic chemicals (Lock et al. 2015). Toxic chemicals encompass commercial or agricultural chemicals, and processed foods are considered chemicals. I am emphasizing two in this dissertation: food as exposure and exposure to toxic chemicals. Medical anthropology on toxicity comes out of critiques within feminist science and technology studies that approach the environment as co-constituted and in dialogue with human and non-human species (Müller et al. 2017). Similar work was done in molecular biology and endocrinology with addressing chemical toxicity and pesticides (Soto, Rubin, and Sonnenschein 2009; Hayes et al. 2002; Colborn, Vom Saal, and Soto 1993).

Environmental epigenetics as a lens thus enables me to address the multiple scales of a phenomenon: biological processes happening in the body and the social processes that emerged or social processes left behind by the use of chemicals. As a material thing in the world, chemicals have their bearing on organisms that are not always universally evident but indeed temporal and pervasive. Pesticide chemicals are produced expressly to kill—plants or insects, ironically, to better produce food. In other words, chemicals may be spread widely in multiple contexts: in water, rain clouds, soil movements, peoples' clothes, foods, and their bodies. However, chemicals aren't used in a vacuum, thus spreading and polluting the environment: soil, water, flora, and fauna. Researchers of toxic landscapes argue that it is crucial to shift the focus away from individual choice and responsibility to one of recognizing

the material reality of how chemicals are the product of economic processes. Providing a lens into how chemical exposure makes for biological differences shifts the focus away from individuals to an understanding of collective causation and, therefore, collective responsibility (Mansfield and Guthman 2015). The goal, therefore, is to go beyond the dualistic trope and speak to “the porosity and impurity of presumed nature/society, environment/body boundaries” (Mansfield and Guthman 2015:4).

By "chemicals," I’m specifically referring to agricultural chemicals used in the process of growing local corn and chemicals in the form of processed foods. The social processes are also multiple. On the one hand, Wixaritari have been confronting the threats on their sacred territories, especially mining and other extractive industries that are incredibly important and highly toxic to the environment and their cultural and spiritual wellbeing as a people. But what about the other not so visible processes related to nutrition and foodways that eat at them from the inside out with adverse health outcomes? Therefore, by "biological processes," I’m referring to implications of the chemicals on human development and psychological trauma associated with historical oppression and modern-day conditions of abject poverty coupled with low-intensity warfare for indigenous groups who are resisting the geographic destruction of their territories (Stone et al. 2007).

Agricultural chemicals are the product of economic processes where technology flows from the global North to its use in the global South. Later in Chapter 3, I will delve into more specifics of the material history of the introduction

of chemicals and the state programs of development in the Gran Nayar region. In this chapter, I examine social processes and biological processes through the lens of environmental epigenetics to comment on the implications for health outcomes related to the social consequences of vulnerable populations, namely indigenous people and Wixaritari, in particular. The social processes include regional, national, and global agents and industries that engage in resource extraction of subsoil and genomic information of indigenous people. Using epigenetics as a lens that takes into account humans' activities as embedded in the environment, I'm also extending the framework to address how Wixaritari make sense of the toxicity, violence, and threats to their lands while taking actions to take care of their sacred territories from further environmental destruction.

I treat the environment not just as an object but as sets of experience(s). This is known as biological embedding when life experience alters biological processes to affect later-life health and wellbeing (Aristizabal et al. 2019). Experiences are interconnected with a material past, a present reality, and with how people might envision a future. Alexis Shotwell describes the "interdependence of present toxic dangers as remnants of past innovation with a connectedness to a future" (2016:77). He offers the example of DDT used to clear mosquitos that later produces cancers and fragile eggshells (2016). It's worth pointing out two imperatives of experiencing toxic environments. First, toxic environments may be diffuse, and secondly, these experiences may be temporal. Diffuse experiences may occur because toxicity can penetrate barriers and spread out, much like penetrating the skin or spreading

throughout a geographic area via winds, water, and foods that help toxins spread to other organisms. In what follows, I address the role of food and nutrition as certain environments that shift genetic outcomes.

Nutritional Epigenetics

"Environmental epigenetic research tracks mechanisms by which social forces—from pollution to nutrition to mothering to traumatic experience—become molecularly embodied, affect gene expression, and induce durable changes in behavior and health" (Landecher and Panofsky 2013). The critical issues in food as an epigenetic factor are its link to conditions like cancer, metabolic syndrome, obesity, and diabetes in which food chemistry is understood as part of the molecular environment (Landecker 2011).

Studying the impact of foodways offers challenges to link food intake with health outcomes. Emily Yates-Doerr (2015) studies obesity in Guatemala and challenges the view that health can be measured through numerical values as she traces the social processes of local peoples' relationship to regional foodways. She contextualizes obesity in terms of modernization's abstraction and calculation regimes of governance such that food consumption is no longer a communal experience but an individual negotiation of metrics. She wants us to see how obesity is not just an effect of a changing local area with chain stores and fast foods; she demonstrates how the concept of obesity is a way of organizing how bodies fit into the change.

People of the corn become people of corn syrup in a similar study on metabolic syndrome by Alyshia Galvez (2018). She shows that the North American Free Trade Agreement (NAFTA) contributed to altering the Mexican rural food systems and contributed to alarming rates of diabetes in Mexico. Galvez relates the epidemic of diabetes to the systemic suffering and trauma that is marked by elevated allostatic load on the bodies of migrants. The combined conditions worsen each other, i.e. are syndemic (Merrill Singer 2009; Merill Singer and Clair 2003). The concept of a syndemic has become integral to better understand how structural violence and foodways intersect with adverse health outcomes. Other ethnographies have engaged structural violence to address the social environments that influence adverse health outcomes among vulnerable populations (Yates-Doerr 2015; Gálvez 2018; Solomon 2016).

Key Issues and Debates in Environmental Epigenetics

Environmental epigenetics is a paradigm shift in how we understand the processes of phenotype or gene expression. Whereas gene expression was thought to have rested solely on inherited genetic information, post-genomic discoveries have confirmed non-genetic influences on health outcomes and behavior (Sapolsky 2017; Moore 2015).

Some key issues deal with contamination and transgenerational effects. In terms of the epigenetic landscape, it is complicated. Still, a set of factors such as cell type, age, the timing of experience, sex, and DNA sequence make up some possible

variables of the depth of contamination (Aristizabal 2019). These factors make it challenging to establish causal connections; however, molecular profiling and epigenome editing along with comparative animal and human longitudinal studies may provide the transition from correlative to causal (Aristizabal et al. 2019). Still, there is research that suggests epigenetic modifications can be inherited across generations, i.e., the environmental experience in one generation could alter biology, behavior, and health in the next (Thayer and Non 2015; Crews et al. 2012; Xin, Susiarjo, and Bartolomei 2015).

While epigenetics is a paradigm shift with promising implications for how exposure to toxic chemicals in the environment influence gene expression, practicing caution that it explains everything is warranted (Sapolsky 2017; Thayer and Non 2015). While there is no doubt exposure implies some alteration to organisms and development, “a straightforward correlation between DNA methylation and RNA expression has not held up across studies, as we learn that control of gene expression involves the interaction between many epigenetic factors” (Thayer and Non 2015, 730). Another caution is to play the blame game on pregnant mothers for environmental exposure (Thayer and Non 2015). There's also been a fair amount of recent research indicating that fathers can pass on epigenetic changes to their offspring as well. For example, male farmworkers who handle pesticides may be altering the epigenetics of their sperm and may cause epigenetic changes in their offspring (Rothstein, Harrell, and Marchant 2017)

My Contribution: Living with Toxicity as Ongoing Environmental Destruction and Bodily Trauma

The embodied ethnographic experience provided an emic perspective of the how people are embedded in social and biological processes that increase their risk to toxic exposure both at work and at home. The unique case that the Wixaritari and the transformations in their landscapes and bodies offer is a historical perspective about how they have addressed environmental destruction in their territories since colonial mining (Rojas 1993). Their responses to such destruction offer two key points of analysis. The first is that for Wixaritari, the proverbial end of the world scenario happened several times, starting with the colonial invasion and repeating in the multiple 50-year wars and significant movements of resistance (Rojas 1993). Despite those historical struggles, Wixartiari have maintained their Sierra territories and extended sacred sites from the coast in Nayarit to the desert in San Luis Potosi. Wixaritari persistence is because of their adherence to civic-religious cargo positions that are required of all adult members including women of their society. The positions have included serving on committees premised on protecting their sacred sites.

The current threats that I present throughout this study have to be situated in historical contexts lest we fall into a trope of pathologizing local people as not having agency (Murphy 2017; Lock et al. 2015; Alaimo 2010). The responses of Wixaritari reflect how their social structure of the cargo system and adaptations protect their sacred sites. Furthermore, Wixaritari leaders have allied with outside environmental

activist organizations and TV and music celebrities because of the growing environmental awareness of global climate justice.

This study also addresses the reductionist idea that if it is possible to remove the toxicants from an environment, then the epigenetic markers will disappear in organisms affected by that toxicant. While this outcome might be true in some specific laboratory setting, actual responses in outdoor contexts may be more complicated when considering the social conditions of vulnerable populations. Furthermore, reductionist approaches also reduce exposure to individual choice, especially when dealing with foods. This approach overlooks the systemic nature of the burden of the direction of more comprehensive policies and development health programs. From this perspective, later on in Chapter 3, I examine the development programs of various agencies in the community of Nueva Colonia (state, national, and NGOs).

Mexico's Biotech Response to Metabolic Disease

In order to critically examine the implications of reductionist logic, I also connect this study to a broader debate around the sequencing and nationalization of genetic material for the explicit purpose of finding "ethnic remedies" to health problems happening in Mexico and around the world. In the process, Mexico is partnering with biotech firms and private money to build a Mexican genome. Unfortunately, privatizing the public's genetic information and restricting its use is wrought with ethical concerns (Schwartz-Marin and Restrepo 2013a). Mexico and

other nations around the globe have partnered with biotechnology to engage in global genomic research to sequence and nationalize genetic information. Biotechnology companies are invested in commercially marketing “ethnic remedies” to emerging global markets using genomic sovereignty. What is emerging is a post-genomic bioethnic type of national diversity. India and Brazil, for example, have enacted laws to protect their nation’s genetic category.

The legal move to nationalize genetic information has been termed ‘genomic sovereignty’ (Stone 2019)Seguin 2009; Benjamin 2009) to protect the patented genetic category(ies). Mexico’s goal is aimed at directing health efforts to advance cures, prevent, and discover major disease alleles. A type of genomic biopolitics has also emerged because instead of allowing medical genomics to be a national public good, the laws prevent access to data by ordinary citizens or communities while making such information available to the global scientific elite (Schwartz-Marin and Mendez 2012). Often the research is partnered between governments and large private, multinational firms. Governments are invested in focusing in and out of racial politics (Schwartz and Restrepo 2013).

Examining biotechnology from a critical medical anthropological lens, post-genomic technology is seen as embedded in cultures and histories and never autonomous from histories of colonialism, scientific racism, eugenics, and specifically, global market pharmacogenomics, the process of tailoring “custom” drugs (Shuldiner et al. 2013). As many scholars have pointed out, the law of genomic sovereignty and the partnerships it creates reflect colonial practices of resource

extraction and privatizing public information while unearthing old practices of scientific racism regarding indigenous people (Schwartz-Marin and Restrepo 2013b; Siqueiros-García, Oliva-Sánchez, and Saruwatari-Zavala 2013; Benjamin 2009). "When we talk about the impact of technology on society…[we're] talking about the impact of one kind of social behavior on another" (Pfaffenberger 1988). The takeaway point of genomic sovereignty is to show an example of a reductionist view using genetic determinism to try to solve a problem that ethnographic evidence shows is influenced by environmental and social factors, not just genetic endpoints.

Mexico's telecommunications mogul Carlos Slim invested a reported USD 65 Million into the Slim Initiative for Genomic Medicine in the Americas (SIGMA).[5] The projected goal is ambitious: to establish ethnic-specific disease alleles. Mexico has a diabetic epidemic; SIGMA uncovered the first genetic risk factor for type 2 diabetes-specific to Latin American populations labeled "SLC 16 A11" (Wade 2013).

SIGMA takes a reductionist approach to find the genetic culprit without taking into consideration the environment. Some have argued the problem with post-genomic scientists is that they are seeking to find congenital disease determinants by using samplings of individuals' genetic ancestry while not taking into account the social processes of different social groups (Shim et al. 2014).

The ethical concerns include, but are not limited to, access to gathered data, informed consent, privatization of public data, and ultimately an unequal research arena between those who have access to data and those who do not. In Chiapas, the

[5] https://www.broadinstitute.org/sigma Partnership with 17 academic and research institutions

Maya ICBG Project is an example of bioprospecting extracting base ingredients in Mexico. The project failed to respect the local autonomy concerning the commercial use of biological resources based on fair and equitable benefit-sharing.

Two positions characterize the genetic resources debate regarding plants and human genetic extraction of information: one claim is that indigenous and local communities can benefit (through health outcomes and economic sustainability) by participating in projects that promote the development of their biological resources. Scholars started seeing these moves by biotech firms as "bioprospecting" (Hayden 2003). Later, scholars began raising the alarm for a type of "biocolonialism" (Hawthorne 2007; Schwartz-Marin and Restrepo 2013). The moral imperative is salient despite a UN body that regulates fair use and benefits encouraging collaborative projects of biological resources. The Maya ICBG Project prioritized investing stakeholders over local autonomy.

In this SIGMA post-genomic case, a population's genetic data is framed as the link to saving everyone from type II diabetes. Partnerships between research interests and nation-states have mapped social categories onto nationalized and patented genomic taxa. A "genoma Mexicano" is the partnership's solution to the growing health problems in which race is implied and is the heart of an imagined national identity (Kent et al. 2015). Meanwhile, indigenous groups are also sequenced and found diversity and uniqueness in genetic material (González-Sobrino et al. 2016). Race comes in and out of focus in different contexts, mainly when indigenous people's genomics is used to boost a nation's diversity and uniqueness and profit (M.

J. Montoya 2007; M. Montoya 2011). Indigenous nations and tribal communities hoping to opt-out of genomic research by claiming sovereignty would be disappointed to know that Mexico built-in a proactive part of their genomic policy that makes all of its populations' genetic data a 'natural resource' since it serves their nation-building project (Benjamin 2009).

Chapter 1 Summary

I began this chapter with two moments in the field in which my body reacted to the environment and I became ill. The incidences inspired a shift in perspective and the need for an analytic lens to incorporate the scales of toxic landscapes but also to encompass how people cope. I make an argument for environmental epigenetics to frame a discussion around the way Wixaritari people understand and address the historical and present conditions that threaten the integrity of their sacred sites and ultimately their wellbeing. The framework comes out of recent developments in biology, specifically epigenetics. New discoveries since the early 2000's after gene sequencing have changed the direction of genetic determinism. Meanwhile, critical medical approaches of the political economy of unequal health outcomes, feminist critiques of environmental toxicity, and science technology studies have addressed how bodies are embedded in social processes that produce health inequalities (Niewöhner 2011; Aristizabal et al. 2019).

A sub-discipline emerged in nutritional epigenetics that tracks the mechanisms by which social processes become molecularly embodied, affect gene expression, and cause change in behavior and health outcomes (Landecker and

Panofsky 2013). I draw from comparative medical anthropological work on metabolic disease in Mexico, Guatemala and India. Metabolic disease is seen as syndemic with stressors related to poverty, labor migration, and discrimination (Yates-Doerr 2015; Gálvez 2018). Similarly, Solomon (2016) challenges popular narratives about "globesity," the intensification of diabetes and obesity, as a matter of adopting the Western diet and lifestyle. An imagined middle class could "afford to purchase the excesses of liberalization" (Solomon 2016:4). Instead of utilizing the trope of adoption, he proposes the idea of "absorption between persons and substances and the extent the body and the world mix" (Solomon 2016:5). Substances for Solomon include everything from toxic chemicals, plastic shrink-wrap, diets, drugs, and the everyday stressors of Mumbai.

Metabolism is examined by each ethnography as more than digestive. To metabolize in the body refers to multiple biological processes such as neurotransmission and the production, blocking or mimicking of hormones (Landecker 2011). This growing body of ethnographic research describes how bodies are continually being remade through medical surveillances and changing parameters of the etiology of metabolic diseases. Such an analysis based on ethnographic research explains how Mexico's response to the metabolic disorder may be reductionist. Like many nations worldwide, Mexico is using the genomic sovereignty law to sequence their population's genetic profiles. The partnerships with biotech firms ensure the needed technology and trained expertise lacking in the global South. Biotech had already been gathering genetic information via consumer genetic

services, and now with partnerships, are stepping up the database to address public health problems of developing nations. In Mexico's case, the SIGMA initiative promised to find the genetic endpoint in the Latin American population for type 2 diabetes, and they labeled it "SLC 16 A11" (Wade 2013). The problem is the reductionist approach to disease as a genetically determined endpoint reflects a pre-genomic obsession. The question remains, 'who owns their genes'? especially since biotech firms in partnership with governments retain exclusive rights to genetic information that call into question issues of access, cost of remedies, and proprietary concerns around the nature of gathering and ownership of public information for public good vs. private interest profit. Genetic determinism fails to consider social suffering and lack of proper nutrition and access to health services among vulnerable populations that contribute to metabolic syndrome. In the next chapter, I delve into the way Wixaritari address the social processes that threaten the wellbeing of their bodies and their sacred landscapes.

Chapter 2: The Wixaritari Cargo System, Healers, and Mediating Conceptions of Sickness and Healing with Landscape Practices

Introduction

This chapter is about Wixaritari care and governance of one another and their landscapes via their hierarchical civic-religious cargo system. Cargo is a dual system of civil and religious hierarchies that indigenous societies in Mesoamerica use to govern their societies (Chance and Taylor 1985; Korsbaek 1996). I focus mostly on religious cargos as the system by which Wixaritari maintain vigilance of their sacred sites. Civil cargos are also discussed in terms of how they have been adapted to address threats to sacred sites. Within religious cargos, healers' or singer's significance both in the community and in the literature is ever-present. I follow with participant observation of one family to show the importance of cargo in their lives for mediating conceptions of sickness and healing with the help of healers or *mara'akame*. *Mara'akame* occupy an important role within the Wixaritari cargo system because they dictate the terms of engagement with the landscape deities as members fulfil religious cargos or fiestas to address a sickness. The literature on cargo is reviewed and I highlight scholars who write about cargo as a way local cosmology is mapped onto the cargo system (Neurath 2000; Padilla-Pineda 2000; Manzanares 2009). I use stories from families that I have known for decades to show how they address individual bodily conceptions of sickness and healing. I broaden the scope to talk about how the community adapts cargo to the larger sicknesses related to toxic landscapes. On an individual level, the conception of sickness is often about avoiding cargo or unsuccessfully fulfilling cargo commitments.

Cargo in Mesoamerican Anthropology

Cargo systems or civic religious hierarchy within Mesoamerican anthropological literature has had more than 80 years of attention (Tax 1937; Camara 1952; Carrasco 1961; Rus and Wasserstrom 1980; Lozano 2014). The first focused study that included an analysis of the social structure of cargo hierarchy in Mesoamerican anthropology was Sol Tax's (1937) piece on the midwestern highlands of Guatemala. Tax was keen to point out two crucial points: "There is more honor and prestige connected with the higher offices, both political and religious" (443). His other point was that, “The function of the secular officials is in varying degrees always partly religious as well; as a group they take part in the ceremonies supervised by the religious officials” (443). Therefore, the cargo system generally was known by the hyphenated term of civic-religious. As Carrasco explains:

> The civil-religious hierarchy [that] combines most of the civil and ceremonial offices of the town's organization in a single scale of yearly offices. I will call it the ladder system. All men of the community have to enter into it, and all have a chance to climb up to the highest steps and reach the status of elder. This system is closely connected with all the major aspects of the community’s social structure (1961: 483).

Despite regional differences, there exist eight defining characteristics that Sara Alejandra Manzanares Monter points out in her study on cargo:

> 1, There exists a number of [cargo] positions, recognized by the community, that are fulfilled in a determined period of time. 2, A hierarchical ordering of cargo positions that obeys a cosmovision that supports the system. 3, [Cargo holder] Leaves daily activities and roles in [their daily] life to take up cargo work and return to daily life once cargo is fulfilled. 4, Community stratification, more than levelling in terms of riches and ideology. 5, Considerable expenses for cargo positions without

> economic remuneration. 6, Granting prestige to the cargo bearer, defining prestige as respect, admiration, social consideration, honor, deference and recognition that the individual receives from the community. Prestige is granted either for the expenses incurred or for fulfilling the obligations. 7, Prestige increases as one ascends in the hierarchy. 8, A close relationship between religion and the managing of power (2009:21) [sic].

A "rest period" between cargo positions is customary as community members get into debt to fulfil cargos because positions are not paid (Chance and Taylor 1985). Depending on the prestige of the position the resources expected to be proportioned can be greater, and in most cases a member is chosen for a prestigious position based on his or her ability to contribute the resources necessary to fulfill the position. Usually, the higher the position's prestige the more costs and resources needed in order to fulfill the cargo. In either case, the rest period is supposed to let a member of the community recover financially from the debt incurred and from the physical demand of certain cargos. Rest periods also give others a chance to serve positions as everyone ascends in position. Hence, some have described it as a ladder.

Cargo plays out differently in different geographic regions of Mexico and the Maya region. The majority of the literature relates cargo with hierarchies as noted above. Carrasco and others are mostly focused on the process of change (Dewalt 1975) or cargo as an economic leveling mechanism (Tax 1953), while others see it as producing patterns of stratification (Cancian 1974). Jan Rus and Robert Wasserstrom approach cargo from a critical perspective (1980), addressing the various myths, e.g., that native people passively accepted a system that Spanish missionaries and Catholic priests cleverly designed for them, or the erroneous position that characterized much of early work that saw Indian peoples' strict adherence to culture and tradition as the

problem of not being able to integrate into the national culture (Rus and Wasserstrom 1980).

Alfonso Villa Rojas focused on the spiritual aspect of cargo further to affirm the notion of cosmovision as the fundamental structure that cargo takes on in a community where kinship is supported (1947). Especially in the communities where old native traditions are practiced, Villa Roja affirms that sickness asails the person who engages in bad behavior or not fulfilling cargo. Those elders in positions of prestige have the social influence and the spiritual capacity "to cause illness" (49). “By the 1950s cargo is considered an institution and a characteristic of traditional societies that incorporates cargo into social and cultural systems” (Manzanares 2009). Building on that initial work, Fernando Camara Barbachano studies cargo in Tenejapa and was the first to come up with the idea that cargo is an economic leveling mechanism (1952). Building on Barbachano’s theory, Eric Wolf proposed the concept of a "closed corporate peasant community" (1957) that is egalitarian due to the leveling mechanism that prevents the emergence of wealth differences or exploitation. According to Wolf, the community is closed and corporate because it holds rights and membership and limits its benefits to members and discourages participation in the outside world. Frank Cancian (1974) took up the notions of economic mobility and its influence on how the cargo system evolved in the community of Zinancantan, Mexico. He argues that while “cargo service and ritual is not changing appreciably: only their meaning for the community rank system is changing” (Cancian 1974:172). He attributed the change in meaning to increased

population, economic mobility and the introduction of waiting lists for prestigious positions, especially if a member's father had occupied the prestigious position (172).

The primary debate regarding the cargo system has to do with the significance and purpose of the system. Chance and Taylor astutely sum up key questions:

> "(1) Does the civil-religious hierarchy level wealth differences or not? (2) Does it in fact pump a substantial amount of wealth out of the community or not? (3) Is the hierarchy best regarded as a community defense against exploitation by outsiders, or as an instrument devised by the very same outsiders to subjugate and exploit the Indian population?" (Chance and Taylor 1985).

Anthropologists who wrote about cargo before the 1960s tended to treat indigenous communities as static and, therefore, the cargo system as a continuity from pre-Hispanic or early colonial (Friedlander 1981). Such scholars tended to go into the "levelerists" camp that saw cargo as a means of preventing wealth accumulation (Nash 1958; Tax 1953; Wolf 1959). Early studies tended to be ahistorical, so in response some scholars started to contextualize cargo in context to population growth (Cancian 1965) and development projects (Wasserstrom 1978). Judith Friedlander points out two camps, "closed corporate community-levelerists" and "society-class conscious-dialectical materialists" (1981:133).

One of the critical issues to consider is to what extent scholars have taken into account national and global political economy in how local communities adapt their cargo systems. As I mentioned before, cargo practice has nuanced differences based on geographic area and local and regional politics. Judith Friedlander, for example, has found that "In Hueyapan, [cargo] does not work in opposition to, but in concert

with, the outside power structure" (1981:132). Her study gives us an example of a cargo system that has been secularized. It seems to suggest that the more a community adheres to their cosmology and therefore bases their cargo on their cosmology, the more the system maintains the local cultural traditions and customs. This is an important point because Wixaritari fashion their cargo system on their cosmology. Every member of their society must engage in either community or familial cargo pilgrimages to their sacred sites as a sort of "register" (Liffman 2000). However, their sacred sites are under severe threats. They have strategized by creating vigilante committees and redirecting existing cargo positions to fill ranks in organizations dedicated to the protection of their sacred sites.

Literature on the Wixaritari Cargo System

The literature that is concerned specifically with Wixaritari cargo is mostly concerned with how cosmogony and social order are mapped onto their sacred geography (Lozano 2014; Neurath 2000; Gutierrez del Angel 2002).

The first mention of the cargo system in the Wixaritari anthropological literature came in 1888 with Rosendo Corona's piece on the practice of ritualized corporal face painting (Manzanares 2009). Corona was well aware of the Wixaritari and land disputes. At the time, he was sent by his brother, the Governor of the state of Jalisco, to demarcate Wixaritari territory boundaries and settle the discord with the adjacent Hacienda San Antonio de Padua (Stephens 2018:57). Subsequently, the early ethnographic studies on the Wixaritari would mention cargo (Diguet 1899; Lumholtz 1900; Zingg 1938); however, the topic of the Wixaritari cargo system was not central

in the early literature. The focus on cargo with its function in Wixaritari society and in the context of land struggles would come much later (Weigand 1992; Neurath 2000; Liffman 2011).

After some fanfare from Mexican anthropologists writing about cargo in the 1950s and 1960s in other regions, Wixaritari scholars started giving cargo due consideration. For example, Marina Anguiano Fernández's (1974) study on the changing of the staffs of power in the community of San Andres describes 14 civic cargo positions. Similarly, Fernando Benitez's *Los Indios de Mexico: Antologia* (1989), describes pilgrimage positions and rank, although without mentioning the functions of each within the rituals. He also doesn't distinguish between familial and temple cargos, so his study reads as a cursory.

The 1990s are marked by more depth in the literature on Wixaritari and cargo specifically. Phil Weigand's (1992) study on the Gran Nayar region includes a section on Wixaritari civic-religious structure. He identifies four main cargo hierarchies among Wixaritari: *kawiterutsir,i* or the Council of Elders, civil, Catholic church, and *jicareros*, or votive gourd officers (131). Weigand argues that ceremonial authorities no longer have power since Wixaritari social structure has collapsed (1992:140). However, later, in a co-authored introduction, he argues, "They [Wixaritari] protected their unique ethnic identity by adopting an 'incorporative model' by making accommodation to some colonial innovations, while hardening their resistance to full acculturation" (Introduction to Zingg 2004: xvi). Beatriz Rojas published foundational material on Wixaritari history including multiple instances of 50-year

wars, countless uprisings in the 20th century and a short ending on the Plan HUICOT (Rojas 1993). She argues against the view that Wixaritari are a wayward isolated group by pointing out the extensive networks they maintained over hundreds of years with other indigenous groups in the Gran Nayar Region as they fought in multiple wars and local resistance campaigns (1993:201).

Olivia Kindl's (1997) study on Wixaritari votive gourd officers agrees with early work by Villa Roja who argues that the central organizing principle of cargo is local cosmology. A follow-up study on the *xukurikate*, or gourd officers, by Monter (2009) adds sophistication and complexity to the analysis of Wixaritari social structure by focusing on *xukurikate* and kinship and marriage customs. She argues that *xukurikate* cargo hierarchy is the basis of how kinship, power and marriage alliances are managed and passed down in Wixaritari society (1993:22). The *Xukurikate* reenact the "cosmic battle" among deities and humans during pilgrimages for the five-year cargo service (Monter 1993:17). The reenactments occur by assigning members a deity name that reflects their characteristics and embodying the deities through the pilgrimage. Songs and ritual speech help to reinforce how members embody the dieties. Other battles are reenacted among Wixaritari, as seen in the literature, for example, Robert Zingg collected some of the earliest documented myths (1938). Fikes, Weigand and Weigand (2004) edited his collection with a section of stories and songs that reflect how Wixaritari incorporate historic events into their cosmology. The authors argue that Wixaritari myth's primary purpose is to maintain positive relationships with ancestors who control nature, and as long as they

perform the rituals that perpetuate the world of the ancestors, they will be blessed with good health and abundant subsistence (2004:xxxvi). Similar reenactments occur in other parts of Mexico, as is the case with the *danza de los Tastoanes* reenacting colonial stories of resistance in Olga Nájera-Ramirez's study on a Mexican festival in the outskirts of Guadalajara, Jalisco (1997).

Johannes Neurath's study (2002) is centered on kinship and cargo hierarchies in the temple. He confirms Wixaritari kinship structure is bilateral or patrilineal (151). He builds on previous work by focusing a chapter on their cargo hierarchies in the *tukipa*, community temple. He contributes to a more in-depth comparison between *xiriki*, or small, distant temples and community temples or *tukipa* and their differences in terms of ritual processes and functions within the wider social structure (2002:149). *Xiriki* temples are home to specific ancestors or deities for which the temple was dedicated as well as the five deities of corn that link all temples to the community temples (150). One of the main differences is that *xiriki* temples do not have hierarchies while the *tukipa* has two main hierarchies: the *jicareros,* or gourd officers and the *kawiterutsi*, or fire keepers (150).

Women play an important roles in both civil and religious cargo appointments, and later studies analyzed their roles in both civic and religious systems (Téllez Lozano 2014). Women act as partners with their husbands, and an upper-level cargo holder must have a wife as she is the one that instructs the wives of the *topiles* assigned to her husband (Téllez Lozano 2014). When a man is appointed a higher-level cargo, and he is absent a wife, his mother, or another female member of

his family is asked to accompany his cargo. In some instances, a cargo could be denied to a man if the woman refuses to accept it (Téllez Lozano 2014).

In my study, I am more concerned with a specific type of change. Namely, how Wixaritari have adapted cargo to address threats to their landscapes and to galvanize direct actions among its members. Many have written about Wixaritari cargo and its basis in local cosmology (Neurath 2000; Robert Mowry Zingg 2004; del Ángel 2002; Schaefer and Furst 1996). I am building on this work by looking at how cargo mediates cultural conceptions of bodily and landscape sickness. To elaborate the point, the next section includes ethnographic information I gathered in 2015 in Nueva Colonia among the Garcia family and their cargo commitments.

The Garcia Family and Their Cargos

The stories about the Garcia family show two things: the importance of cargo in their lives and how fulfilling cargos or not fulfilling them mediates cultural conceptions of sickness and healing. The other point of this section is to show how Wixaritari use religious cargo or fiestas to mediate the conception and resolution (or not) of sicknesses and healing. Recent civil cargo adaptations have been set up by the Council of Elders to respond to the various threats to sacred sites. I provide an example of several of those adaptations. The point in mentioning the adaptations is not to go back to the debate about whether cargo has a pre-Hispanic origin or is an adaptation to Spanish religious formations but to show that cargo, for Wixaritari, reflects the agency to create their own social processes to deal with the threats they understand to be the origin of their toxic environments and the on-going stressors.

Cargo connects people's bodies to the landscape through pilgrimages and bodily sacrifice like hunger, sleep and long travels. The temples are erected in geographic space according to the old stories that describe the routes that the deities took when they made the world. Their religious is based on maintaining good relationships with the non-human landscape deities. The spiritual mandates elevates a sense of individual and collective responsibility. In Wixaritari cosmology, landscape deities ensure good health, good harvests, and balance of the universe as long as humans do their protocols to appease the deities. However, neglecting the responsibilities and not performing cargos is a major reason for bodily sickness according to Wixaritari conceptions of sickness and healing.

Totopika is an elder in his mid 60s. Totopika means "singer of the origin or sacred songs." He has served 30 plus years of *lo sagrado*, the religious hierarchies of the cargo system. Toward the end of that period, he pushed himself along with crutches after doctors put a metal plate in his hip after a recent bus accident. The whole time I was in the field he was recovering from hip surgery. In his recovery there was no quit in his will to complete his cargo commitments in the temple even if it risked his recovery.

The accident was the worst timing for Totopika's cargo. His cargo is laborious, especially for someone in his mid 60s, but now, on crutches and in constant pain, it's almost impossible. The doctor said it would be eight months before he could walk without crutches. The dry season is ending and he won't recover in time to plant corn. His cargo involves all-night singing in the temple, hunting a deer, and leading

his gourd officers during pilgrimages. He relies on his corn harvest for the year's-worth of tortillas. And he relies on healing people to get by. With his body in pain from hip surgery recovery, he sits in the *mara'akame* chair and sings to the *Nakawe* (the Grandmother Germinator who created everything in the world including rain). The transition from dry season to wet season in the Sierra is evidenced by the millipedes, land turtles, and fast-moving water beetles who are members of a vast network of Water Workers that include spirits associated with particular landscapes like waterfalls, water holes and a side of a mountain that springs multiple water sources. The Nakawe is known as an irreverent deity who wants a blood sacrifice; if not she gets offended and turns into the Nakawe Monster and eats the children and village (Neurath 2000; Lozano 2014).

Totopika is married to Morning Star who is about 30 years old. She couldn't have kids so they adopted a son, Rotilio, who is 13 years old. Totopika had two sons with his first wife. Muvieri, in his mid 20s, is married with two children and lives in another village where Totopika served as a temple singer. And Mau, in his 30s, is also married with three kids. Totopika grew up in Santa Catarina and moved around its main *tukipa,* or temples*,* serving multi-year cargos. He also worked for mining companies and joined the many who work for the large agricultural fields in Fresnillo or Nayarit.

Each of Totopika's sons have cargo. At least they should. Macario was fined for skipping three times. I saw him hanging out at the corner store sipping beers, and

he told me he had to pay a fine of 10 thousand pesos. He skipped on his cargos because the mining company he works for sends him to other states for work. I remember having a conversation with Rotilio, Totopika's youngest son, about whether he would follow his dad's path. He was sure he would not want to be a healer or singer in the temple like his dad. I asked him why, "It's too much work," he responded at his 13 years of life. The other son, Muvieri, could potentially take over his dad's medicine bundle. He's still young in his 20s as many healers become initiated later in life. However, now that he's educated and can use computers, the Council of Elders may have other plans for him to serve more administration-type cargos like governor. He could also do both, religious cargos and civic duty, but by the time Totopika was in his mid 20s he was already healing children, and Muvieri is nowhere near that level of healing much less talking about it. When I arrived early on in my stay, I made a point to talk to Muvieri about my intent in the *Sierra*. I told him I was not there to follow his dad around like a lot of *tewaris* (neighbors) do in search of some esoteric healing art or to later claim I am a shaman. I told him I came from family medicine and that if I wanted to pursue a healer like that, I would have pursued my Grandmothers' knowledge more diligently over my life and would have been healing like her. I assured him that, if anything, my presence there was to support Rotilio or him in following in their father's path and role in the community and temple. I noticed his relief after I said I wasn't there to steal their cultural knowledge or insert myself where I didn't belong. Instead, I told him about the migration of Wixaritari who live in Lamont, California and Oxnard, and that my

intent was to do a study related to the migration of Wixaritari from Colonia to California. I added that after such a study one can make more informed decisions about how to best use the fact that people migrate as a way to foster more support on both sides of the border. I cited the case of the Oaxaqueños who have a transnational organization that helps support local fiestas. The organizations are certainly not without their internal problems but at least operating with relative autonomy while allying with outside organizations.

I highlight the story of Rojo, Totopika's cousin, to illustrate the importance of cargo in their lives even if they are not *mara'akame*. Rojo fell off a 12-foot ladder while picking oranges in Lamont, California. The way he envisioned getting better from his bodily aches and problems fainting was to go back home and perform a cargo or fiesta. "Tengo que hacer fiesta y contratar un *mara'akame*. Tengo que poner un toro." (I have to make a fiesta and hire a mara'akame. I have to sacrifice a bull) He would say. He interpreted his mishap to being away from his cargo commitments and that the only way to get better would be to return home to sponsor a fiesta and hire a *mara'akame*. On the phone he would faint and come back. He would say the back of his head hurt. He was going to the doctor but in his mind, he had to return home to get better. So, he left and after sponsoring the fiesta, he got better and returned two years later to work in the fields of Lamont only this time, with Maria Elena, his wife.

Mara'akame Healers and Singers

The healers I have known among the Wixaritari use a *muvieri,* or magic-wand. The *muvieri* is a pointed stick of hardwood about six inches long with feathers held together with yarn. Ideally the two feathers are from each wing of a bird of prey or macaw. The top part of the wand is down feathers usually taken from the chest of a bird. The assembled *muvieri* represents a bird. The healer uses the feathers like a broom to sweep together what eventually healers extract by sucking it into their mouth. The patient laying down and the healer bends down to put their mouth close to the surface of the skin. I've observed some healers use the muvieri staff like a straw to extract a sickness. The origin of muvieri healers comes from deep rooted sense of time before the Spanish colonial invasion to an era of the Cora Chiefs who ruled the region of the Gran Nayar.

The origin of *muvieri* healers comes from what they call "the first *mara'akame."* The first one was said to have the power to communicate with the Sun who taught them the ancient code of healing. The first *muvieri* healer lived in a temple in the Mesa del Gran Nayar. The temple was essentially a tomb for the mummified *mara'akame* cultural hero. The Cora Chiefs who governed all the tribes of the mountainous area of El Gran Nayar were in charge of the temple-tomb. Today, the descendants of those groups now make up the Cora: Tepehuano, Wixaritari (Huichol), and Mexicaneros or Nahuatl-speaking groups came over by the hundreds of thousands after the Spanish enticed them with incentives in exchange for helping

them pacify the region, which took nearly 200 years to accomplish (Rojas 1993). Thus by 1722, after years of battle and with the help of Nahuatl trackers recruited from Mexico City, the Spanish found and destroyed the Mesa temple of the Gran Nayar (Weigand and de Weigand 2000). The Cora fought to the end, but the destruction of the temple of the first teacher disrupted the cultural and spiritual meeting grounds where the regional tribes met to learn the ways of the first healer. The Cora Chiefs were in charge of administering the knowledge to the other groups of tribes. They governed by assigning cargos to the surrounding groups who sent representatives to convene at the mesa. The orders were cargos to perform certain rituals, to undertake pilgrimages, to build temples in landscapes, and to perform agriculture with certain types of corn in a certain way (Robert Mowry Zingg 2004). The Cora Chiefs were responsible for what could be characterized as a regional cultural movement that went on at least hundreds if not thousands of years before the Spanish arrived (Robert Mowry Zingg 2004).

Personal Background in Mesoamerican Healing

I had enough firsthand experience in Mesoamerican healing practices and beliefs that when Totopika and I spoke he asked me how I know a lot about *mara'akame* medicine and healing. I told him my grandmother. Doña Mary of El Briseño, who had lived on the outskirts of Guadalajara, practiced *herbolaria,* and *limpias con huevo* (cleanses with egg). She treated *bilis, mal ojo, susto,* and *nervios*[6]

[6] Herbolaria, herbal knowledge. *Bilis* = bile. *Mal ojo* = *evil eye. Nervios* = nerves

She made essential oils that she used to smother an egg, then massaged it a patient's body for *limpias* (cleanses). She also made cataplasms for all sorts of topical and internal ailments, inflammation and pain. Similar to how *mara'akame* suck things from the body using their mouths aided by their *muvieri*, the egg is the instrument that does the sucking. Doña Mary would interpret what the egg captured using water or fire. She would crack the egg in a clear glass, half-filled with water so she could see the contents magnified by the water. If using fire, she would make a fire in the patio of her house with small branches and keep feeding it branches until the egg stopped cracking and she would sit for a minute looking at the fire.

Whether to use fire or water depended on the illness narrative of the patient. On one occasion I got an allergic reaction to eating deep-fried pork tacos. She rubbed an egg on my entire body and focused around my stomach. She placed the egg in fire. What happened next, I would not believe it unless she also saw it and at the same time we both pointed to the fire and said, "Look, there's the pig," as it was outlined in the flames like a simple textbook drawing of a pig. On another occasion she rubbed an egg around my head after I had a near-death oceanic drowning experience off the coast of Michoacan. She placed the egg in water and found blood clots and bruises visible in the water. I was 18 at the time. After the *limpia* she told me the experience in the ocean was clearly my wake-up call to pursue a healing path. The spirits give gifts and when not practiced they ask for receipts and sometimes that means close encounters with death. Afterall, she pointed out she had 18 grandchildren and I was the only one that asks about her healing much less ask to be healed. And after she

passed away while I was in the field, her practice of healing eggs went with her. No one in the family continued the practice.

My grandmother on my mother's side, Maria Guadalupe, practiced as a *sobadora* and *huesera,* doing massage and bone setting. She also practiced *herbolaria* and made her own rubs and salves. She treated *ajuste de mollera*[7]*, susto, mal ojo, bilis, resfriado, torceduras, nervios,* and *ajustes*. I don't practice healing with egg, but over the course of almost 20 years and with influences from both grandmothers' herb and essential oil practices, I've developed a formula for medicinal salves that has helped me manage pain or soreness. While in the *Sierra,* I would make my own cataplasms and medicinal salves using marijuana and peyote and other herbs to manage the discomfort of walking for eight hours or driving for 12 hours.

Healing Literature in Mesoamerica

Early studies on healers of the Mesoamerican and Maya region were conducted in the 1960s and 1970s. During these decades scholarly work broke away from the trope of magic and witchcraft to one of specialists, recruitment, first-hand accounts and techniques. A pivotal study was conducted by Benjamin D. Paul on bone setters (1976). In Mexico, scholars began writing about spirit healers in the 1970s as well. Kaya Finkler's (1985) studies focused on spiritualists as an alternative and took a nuanced approach to illness etiologies, placing spiritualists within the

[7] *Ajuste de mollera* =Adjustment of the fontenell

realm of a religion within traditional Mexican beliefs. What was important (especially for my case) was that Finkler emphasized the natural and supernatural explanatory model that diverged from both witchcraft and the mind/body dualism of biomedicine. Finkler's main point that I also see happening in Wixaritari spirit healers is that in treatment techniques like cleansings and their symbolic processes, there is less emphasis on the patient-healer relationship and more on how the patient responds to the symbolic importance of the healing process.

Anthropologists have written specifically on healers or shamans in other parts of the world that show how shamans work outside of cultural and social norms as charismatic experts. For example, Nancy Chen's (2003) study focusing on Qigong masters shows how charismatic healers help people feel they are part of something outside of the state chaos. Qigong masters are operating from a position of cultural authority while also being outside of the state. In a similar way, Wixaritari muvieri healers take on a high level of cultural authority and knowledge that patients automatically assume. Anna Tsing's (1993) study of "meratus" of the Dayak community of Indonesia uses marginality as a subject itself to study how shamans' mobility is a feature of the way people confront the dilemmas of state and global politics. Tsing's nuanced approach to the way shamans move across borders and social classes includes domains of material, skin, internal, and spirit, resonates with what I observed of Wixaritari muvieri healers. Manduhai Boyandeger's *Tragic Spirits* (2003) is about how shamans in Mongolia offer interpretations of bodily sickness that include political and social pains of patients. The Buryat people of Eastern Mongolia

have endured the effects of global capital that result in loss of land and the collective farming practices associated with ancestral land loss. State farms brought starvation and reduced livestock. The shamans' interpretations helped link people's lineage with the land, confirming a sense of place for people who felt disenfranchised after structural adjustments (Buyandeger 2003). The overlapping point I am making with Boyandeger's work lies in the role shamans play in linking people to the land. In both my view and Boyandenger's, shamanic work is premised on linking their patients' concerns with the landscape.

The Clinic in Nueva Colonia

From the point of view of local *muvieri* healers, the state values and supports biomedical models over local models. This process of favoring biomedicine happens from the local scale to the global scale. The clinic in Colonia is backed by state and federal support, and it reflects global commitments to address primary care for developing nations. For example, the Alma-Ata International Conference on Primary Health Care in 1978 that took place in Kazakhstan pressed the urgent need for all governments, health workers, and generally the world community, to promote the health of all people, especially in developing countries as the first declaration of its kind. Meanwhile, Mexico was experiencing an economic crisis in the 1970s and by the time the Alma Ata declaration was enacted had already changed its posture toward local medical models to one of integration. Whereas before, local medical

models and the indigenous cultures they came from were seen as obstacles in the national project, by the late 1970s, the government began to set up various support networks to integrate local medical systems and practices to the clinic and hospital settings (Ayora-Diaz 1998). The attempt at integration had its limitations and problems. For one, the fact that the hierarchy of power favored the western biomedical model meant that local healers who were allowed to enter hospitals and clinics ended up deferring to the expertise of clinic staff (Ayora-Diaz 1998).

Figure 7 Clinic in Nueva Colonia. Photo by Nueva Colonia Facebook page

It matters that the resident doctor at the clinic is receptive to local healing practices if the patients request them. During my fieldwork, the clinic doctor had served for over 13 years in Colonia. Over the years, circumstances with patients'

conditions established rapport with the local healers. In conversations with Dr. Mara Carmen, she admitted to not respecting *mara'akame* healers, let alone know what they did in terms of healing. Her western training did not prepare her for what she observed. She would get patients who obviously had something wrong with them, but blood work and analysis did not result in a translatable prognosis and she could not treat them. Meanwhile, those same patients would see the *mara'akame* healers and she baffled that they got well. Eventually she would ask her patients if they wanted a *mara'akame* and which one. Patients would request particular ones. She'd have them summoned and bring them to the clinic. As the patient lay there the *mara'akame* would treat them sometimes for several days straight and the patient would eventually get up and walk away. Dr. Carmen began to respect the efficacy of these shamans' practices. She gave an example of, El Ranas (Many Frogs) whose skin began to dry up and flake from his ankles to his ears. Dr. Mara Carmen was ready to treat him for what she confirmed in our interview to be psoriasis but he wouldn't come to the clinic.

After our interview I saw Ranas hanging outside the store around the corner from the clinic. I knew of him from previous visits. He told me he had spoken to the doctor in the clinic, but that he also spoke to his *mara'akame*. They were set on going on a pilgrimage to *Haramara*, to leave an offering. His prognosis had to do with a cosmology they often refer to as *lo sagrado* (religious cargo system). The sacred refers to the religious *cargo* or fiestas that members engage with to maintain wellness. His condition could be seen as spiritual-somatic, visible on his skin as a reminder that

as Ranas said, "*Cuando no cumples, o te cobra el Consejo o te cobra lo sagrado*," (when you don't follow through with your cargo commitments either the Council fines you or the sacred world does and you get sick). Ranas is referring to cultural conceptions of sickness and healing. The first one and perhaps the most important one, *el no complir*, not fulfilling cargo. The second is *brujeria* (witchcraft). The third is *perder el alma* or *robo de alma* (where the spirit of someone is stolen or lost). The second and third conceptions of sickness are sometimes associated with a dark or envious *mara'akame* who shot a *flecha negra* (black arrow) at a person. To address the first conception Ranas is hiring a *mara'akame* to help him negotiate his prognosis with a deity. The *mara'akame* determines the *cobro* (the offering) according to the severity of the diagnosis.

Wixaritari Territory Sacred Geography

Wixaritari territory is a vast expanse of sacred sites from the ocean on the west to the desert on the east and a pantheon of deities laid out from the coast of Western Mexico to the deserts of Central Mexico. The paths to each of these major sites draw lines that together form a rhombus whose central site is in the heart of the Sierra where I conducted fieldwork. The path to each site is the same ancestral path that the original beings took to create the world and the elements (Neurath 2000). The fulfilment of religious cargos includes achieving family and community temple mandates for each member in the community. These two cargos are fulfilled through

pilgrimages and offerings across their sacred sites. The problem is that these sites are consistently threatened by a variety of actors. The Wixaritari response has always been collective and strategic: creating new cargo positions to address threats, allying with organizations, organizing press events to control their narrative, confronting corporations at their office headquarters, insisting on their right to "consulta" and marching on the streets of the major cities, to name a few. Land disputes with neighboring ranchers and their hired sicarios, state or national development programs, and extractive industries combine to number about 15 current threats to their sacred sites.

I argue that healing is embedded in landscape practices associated with fulfilling cargo mandates because not fulfilling them results in a type of culturally conceived imbalance in relationships between human and non-human that maintain order in the universe. The protection of landscapes ensures individual and collective wellbeing because, for Wixaritari, it means they can continue to fulfill cargo pilgrimages. The healing happens in a collective therapeutic emplotment, or an interpretive activity where ritual narratives are repeatedly performed, placing events into a meaningful story that enhances expectations or discourages bad behavior (Good et al. 1994; Calabrese 2013). In studying Yucatec Maya, Nancy Ferris (1984) used the idea of "a collective enterprise of survival" to show how Yucatecos adapted to Spanish domination through modes of subsistence, kinship and ritual. In a similar way, Wixaritari cargo appointments of "*lo sagrado*" are a collective enterprise of vigilance of their *kiekari* in the face of impending threats. On an individual level, not

performing cargo is a culturally conceived source of sickness. Therefore, performing cargo commitments is a form of collective and individual body-to-landscape-to-non-human wellbeing.

During the 1940s and 50s, Mexico went through a national agricultural reform, and Wixaritari responded by creating an agricultural wing to their cargo system of appointments. The agricultural appointments were part of state reforms responding to larger attempts to bring development programs, namely the Green Revolution, to industrialize the agricultural crops that indigenous communities produced. Since the 2010 struggle to defend Wirikuta, the agrarian wing of the cargo system has instead worked with The Consejo in Defense of Wirikuta to protect their sacred sites in addition to addressing the agrarian issues in the local community.

The Council of Elders had also established a special vigilance committee by 2012 to oversee the sacred sites in Wirikuta, the desert region in the state of San Luis Potosi. In the summer of 2013, while in Colonia, I interviewed a member of the dozen or so individuals who rotated shifts patrolling sites in the desert of Wirikuta. He described dodging sniper bullets and walking up to destroyed ancient temples when doing his rounds. He said it was the mining corporation, First Majestic Silver and its Mexican subsidiary Real Bonanza, which acquired a concession renewal but was halted by a state judge who put a moratorium on mining activities, citing the lack of environmental impact reports. Instead, the mining company engaged in intimidation tactics and destroying pilgrimage sites. The proposed project of First Majestic and Real Bonanza is to resurrect a mine that has been closed for 20 years, named Santa

Ana near the locality of La Luz and extending to the Cerro Grande, which is a sacred site for the Wixaritari pilgrimages.[8]

Chapter 2 Summary

The civic-religious system of cargo is a feature of indigenous communities of Mexico and the Maya region with a 50-year history of scholarship in cultural anthropology. Salient themes that persisted in the literature were numerous: cargo as a "leveling mechanism" (Carmara Barbachano 1952; cargo as a "closed corporate community" (Eric Wolf 1957); and change over time. One of the biggest debates that remains unresolved is whether cargo's origin is pre-Hispanic or a result of historical circumstances. I draw from scholars who see cargo as reflecting the local cosmology, I build from that to talk about cargo as the mechanism that mediates local conceptions of sickness and healing.

Over the years, the Wixaritari have adapted cargo to address the long-term struggles to protect sacred sites and territorial disputes. Cargo is also the mechanism by which ways of knowing and ways of being are perpetuated. Specifically, as members of the community execute pilgrimages to sacred sites, their purpose in life may be revealed as healers, singers and so on. The continuation of cargo practice ensures local customs remain as well as providing a way for the community to systemically maintain individual and collective wellbeing as people care and govern for each other and their extensive sacred geography. There's also another aspect that

[8] http://consejoregionalwixarika.org/?page_id=33

cargo intrinsically enables, which is to act as a system of vigilance of sacred sites against environmental destruction by outside interests. And this is not taken lightly because it is not just a political practice. Protecting their sites is like protecting their mother, their grandmother and all the multitude of relations embedded in landscape temple houses. The Wixaritari engage with ancestral deities through singing, pilgrimages and offerings, bodily sacrifices in the form of hunger, sleep deprivation, toil, labor and animal blood offerings to ensure good harvests, good health and balance of the universe (Neurath 2000; Liffman 2000). The most respected form of healer is that of the *mara'akame* who heals with a *muvieri*, a magic wand. To become a healer, one needs to perform pilgrimage to register at sacred sites. Through this process, the body and landscape are connected through reciprocal exchange involving ritual and pilgrimage. In local conception, a sickness on landscapes is reflected on the collective and individual body.

Chapter 3 Love Spells and the Green Revolution

Introduction

The Green Revolution was a project of the Rockefeller Foundation's Division of Natural Sciences (Mann 2018). In 1968, the Rockefeller Foundation set up a permanent research station in Mexico called the International Maize and Wheat Improvement Center (CIMMYT) (Mann 2018). It communicated with sister stations in other parts of the world as the global program intended to increase surplus with high yield varieties and biocides to provide cheap food for animal feed and humans (Mann 2018). The Green Revolution agricultural technology came to the Gran Nayar region in phases. It had to since the region is without a central political authority. Moreover, major Wixaritari communities overlap with different states, and their corresponding villages are separated by varying Mexican municipalities, effectively ensuring that the Wixaritari are politically and economically disenfranchised. One primary phase of the development programs provided infrastructure to the wayward, revolt-prone Gran Nayar Region —The Plan HUICOT, 1970-1974. The plan constructed "*The Sierra Huichola,*" The Huichol Sierra, a political space (Negrín da Silva 2004). Roads, schools, clinics, and airstrips were built. The program also made centuries-old land disputes resurface between Wixaritari, the state, and neighboring mestizos over land boundaries. Despite the plan's intent to raise the quality of living, the program altered local food systems, which increased the propensity for adverse health outcomes (Galvez 2018). In terms of poverty, as a friend Julio told me, "When

the stores came to Nueva Colonia, no one had money to buy much, so we understood what poverty was after that."

In Mexico, people do not plant corn; they plant *milpa*. Milpa is a style of farming that takes advantage of plant diversity. It also uses fire to prepare fields and fallow periods, which requires that people be mobile, and there must be a sufficient amount of space depending on microecology (Mathews 2005; Alcorn 1984). The Wixáritari call this type of farming *coamil.* Corn is a single plant species that is not able to sustain a civilization by itself. *Coamil* farming practices involve the cultivation of *maíz*, beans, and squash, and a plethora of other supplemental crops that can be wide-ranging depending on the microclimate. It also includes hunting and gathering grubs for meat and medicinal herbs and kinship practices related to food production and exchange. I observed Wixaritari farmers cultivating additional crops like *nopales* (cactus), *verdolagas* (vines), mushrooms, and other fruits and vegetables in their family plots while growing large acreages of local, heirloom corn and beans in the larger parcels just outside their villages. The food system characteristic of Mesoamerican and Mayan *milpa* or *coamil* activities took thousands of years to evolve so it could sustain a civilization (Bartra 2004).

The Plan HUICOT's construction helped the indigenous communities in the Gran Nayar prosper in some ways. Still, it also strengthened the Mexican municipalities' political and economic grip and, by extension, the grip of state and federal governments. Nueva Colonia grew in infrastructure, size, and population because it was situated near a road. That meant smaller hamlet residents would

eventually move closer to take advantage of the boarding schools, government-sponsored stores, clinics, and access programs.

Mestizo farmers who had access to flat arable lands benefited the most because the plan HUICOT reestablished municipal boundaries that favored neighboring ranchers who lived in disputed lands. Farmers with access to flatlands made full use of the Green Revolution package: tractors, high-yield varieties, and biocides. As the neighboring agricultural plots grew, they hired wage labor from the nearby indigenous groups. Wixaritari people began to migrate for wage labor in the lowlands, working for mestizo farmers, and on their return, imported ideas of wage labor into local farming practice. Besides, pesticides and chemicals required cash, so people had to sell corn or earn cash in other ways. Pesticides penetrated traditional *coamil* agriculture even when polycultures persisted.

Plan HUICOT introduced the Gran Nayar region to new sets of epigenetic triggers through the herbicides and pesticides and processed and GMO foods sold through the establishment of general stores in dispersed rural communities. The government established the stores as part of social programs aimed to support rural people with seed money and funnel global market products that partnered with the program.

The political rhetoric touted by the proponents of Plan HUICOT was about eradicating rural poverty (Negrín da Silva 2004; Nahmad Sittón 1996). With agricultural methods backed by international development organizations and national civil society organizations, the plan integrated indigenous and other rural

communities who did not fully participate in the market economy. Indigenous peoples' labor had already been integrated into the market economy historically through mining, but the Green Revolution and subsequent phases of development programs like the Plan HUICOT introduced wage labor to local agriculture in Nueva Colonia. Also, Wixáritari became dependent on agrochemicals and hooked on Coca-Cola and beer (Nahmad Sitton 1996). To execute the Plan HUICOT, the National Indigenous Institute (INI) (mentioned in the introduction) set up regional offices with the goal of Mexicanizing indigenous people through integrated rural development programs (Nahmad Sitton 1996). INI and its policies resulted in contradictory projects of bringing development and assimilation to indigenous territories but ended up causing more harm than good.

Julio de la Torre, my friend, was about 20 years old when the first store began in Colonia. He recalls the first instance when he and the people around him felt what it meant to be poor because they would walk into a store and did not have money to buy anything. He recalls, "That was the first time we knew what it felt to be poor in our community." Today, most of the small stores' products are processed goods and GMO fruit from local, pesticide-using operations. Stores became bombs of incubated epigenetic triggers lining the shelves with instant noodle soup, Nestle products, high fructose corn syrup, colored drinks, and Coca Cola.

Simultaneously, Plan HUICOT distributed agrochemicals that were freighted and scattered throughout the *Sierra*. The central Wixáritari communities, such as Santa Catarina, which Colonia belongs to, San Andres, and San Sebastian, were more

accessible by dirt road. They were prime locations for the first state-sponsored stores. However, there were and still are many smaller communities with *tukipa* centers dispersed in the deeper parts of the Sierra that are only accessible by foot trails. Even in such smaller hamlets that I visited, I saw agrochemicals used and the presence of small stores.

The program infiltrated the whole *Sierra* with tractors, pesticides, herbicides, fertilizers, and hybrid seeds (Nahmad Sitton 1996). The tractors and land credits favored owners of large tracts of land, descendants of colonial land grabbers (Nahmad Sitton 1996). Tractors are impossible to use in the indigenous regions' mountainous ravines. Nor could they be dispersed to *rancherias* (villages or hamlets), where traditional *coamil* agriculture persisted. Coamil agriculture changed, however, to incorporate pesticides and fertilizer. Plan HUICOT had an underlying racist premise that native peoples' diets were incomplete for brain development (Negrín da Silva 2004). The hybrid corn seeds and their chemicals were viewed critically by the Wixaritari I interviewed, who saw the use of biocides as a transformation of human beings. As Julio summed it up as, "*Hay vienen los quimicos*" (the coming of the chemical people). The program used demonstration plots in various Wixaritari communities, but at first, the locals generally rejected the idea that corn could be successfully grown without performing the correct ceremonies. *Mara'akame* claimed that sorcerors raised the corn and would cause illness to those who consumed it (Schaefer and Furst 1996).

Such tampering with the plants was also seen as dangerous for the Wixaritari's medicinal herbs. In *milpa* farming, it is common to see a plethora of medicinal plants. Throughout my time living with several families and attending the therapeutic plant gatherings the local women organized, I learned about twenty or so plants that commonly grew around the *coamil* or were gathered nearby. I recognized many of the herbs from years of use in my family. Plants such as *mozote* are used for digestive ailments such as diarrhea, vomiting, stomach pain, and inflammation of the intestinal tract. *Altamisa*, commonly used for *mal de aire*, the idea that airs penetrate the body (Huber 2001). *Altamisa* is also used to neutralize excessive bile or worms by smashing the leaves in a *molcajete*, using a pestle and mortar made from volcanic rock. *Calabazas,* or squash, seeds are used for intestinal worms, and the leaves of *calabaza* are good for bladder pains, skin burns, and arthritis. Healers use *Chupona* to increase appetite and as an anti-inflammatory. *Cola de alacran* can help relieve digestive problems, diarrhea, fever, anemia, and, as the name suggests, scorpion bites. *Tomate* is used to counter excessive bile. *Diente de león* is also used for bile, as well as constipation, lack of appetite, lung problems, cough, skin problems, abdominal inflammation, kidney problems, and fever. *Duraznillo* is an effective treatment for kidney problems, *empacho* or digestive problems, sharp digestive pains, and blood sugar levels for people with diabetes. *Epazote* treats digestive issues like parasites, diarrhea, and menstrual pains, birth contractions, while *empacho* addresses air in the stomach, acid reflux, bronchitis, and inflammation from blunt force trauma. *Espinosilla* is used for colds, fevers, cold and hot flashes, bronchitis, cough, skin

issues, kidney problems, *susto,* and *aire*, or fear and hot/cold air. *Estafiate* helps relieve stomach problems, intestinal worms and pains, diarrhea, *empacho,* and fever. *Manzanilla* is prescribed for digestive discomfort, inflammation, or stomach pain.

Medicinal plants have a partnership with the *trabajadores de la tierra*, the soil workers as Totopika, the elder I lived with, explained. The soil workers are similar to the water workers, more-than-human entities, who are responsible for bringing water to cold springs on the sides of mountains that we tap into for our freshwater. The soil workers are responsible for helping plants grow and for maintaining the health of the topsoil used to cultivate crops. People say that agrochemicals offend the soil workers, in a similar way to how cement tanks around fresh springs insult water workers. Totopika explained once that water workers do all this work to make sure we have fresh water, and the cement undermines their effort. They take offense and move the water so it doesn't collect in the concrete catchment. Soil workers are offended in similar ways by chemical use, resulting in weak crops and seeds and potentially more human sickness.

According to several Wxáritari elders I interviewed, hybrid corn had a short tenure in *la Sierra* because of the multiple microclimates associated with geographic features such as cooler mountaintop settlements and more humid ravine settlements. Hybrid corn was simply not acclimated to varying conditions. The seeds, fertilizer, and herbicide proved too costly for many. Another reason my friends gave for the failure of hybrid seeds was that heirloom varieties were better tasting and more nutritious than hybrid varieties. Hybrid seed varieties tended to be used mainly to

feed their animals, and they were grown in larger parcels of land away from the home plot. In contrast, heirloom varieties required ceremonial protocol, so they were grown closer to the family temple and reserved for better tasting and more nutritious tortillas and tamales. While the hybrid seeds of Plan HUICOT produced larger yields, according to my contacts, they only did so with the heavy use of agrochemicals and concentrating all labor and land space solely on corn. Therefore, the use of hybrid corn was short lived in *la Sierra* as people went back to the original seeds. But what remained in practice to this day are the agrochemicals in *coamil* agriculture and the changing way people cooperated with one another.

Before the introduction of these chemicals, Totopika explained, people would help each other. After the large agricultural plantations sprang up in neighboring cities of Fresnillo, Zacatecas, local people could work and get paid a daily wage. Plan HUICOT introduced the idea of wage labor into their agricultural practices. Now, when someone helps their neighbor in the mountains, they expect to get paid compared to the daily wage earned in large industrial farms in the lowlands.[9]

Totopika hired one of his neighbors, Martin, to plow his field. For plowing a piece of land of about half a hectare, the neighbor charged him 300 pesos. Martin and I were standing to the side as one of his sons guided the horses, making the *surcos* (the lines created by the plow). Martin explained he usually charges more, but he charged him less out of respect for his elder, Totopika. I asked him if there was a time

[9] In 2015 the daily wage of a migrant worker in nearby plantations of tomato or cucumber was approximately 100-120 pesos. Roughly the dollar was at about 15 pesos per USD dollar.

that people would help each other without the expectation of money. “We all got to eat. Everything goes up except our wage,” Martin said. I hadn’t seen Martin in at least 16 years. I always knew him as having multiple wives when I met him in Las Latas. He had hired Totopika to cast love spells to acquire his wives in the early 1990s. He was doing well economically both in agricultural endeavors by maintaining several plots and a successful partnership with an art promoter that eventually went sour by the late 1990s. Simultaneously, his corn plots got a streak of bad luck while also serving temple cargos, which took away from endeavors. After returning from one of his travels, his wives left him. He moved to the *barranca*, the ravine, to focus on rebuilding himself and his children.

Changing agricultural practices also change gender relations and marriage patterns. I learned this during one of my first visits to Colonia and the temple hamlet of Las Latas in 1997 when I stayed with Martin and his family. He had two wives living with him at the time. People descended to the central ceremonial grounds near the temples. A handful of adult males with up to seven wives could be observed. How does a man go about acquiring so many wives?

One of Totopika’s many areas of expertise is the love spell. He described his expertise as making couples love each other again and making a woman dream of the man who hires him. The fee depends on the status of the family the female comes from. the higher the barter in the form of an animal, firewood, sacred items, corn for tortillas, or just about anything that would be traded for his services. Money is accepted by a *mara’akame* but rarely explicitly charged. He told me how the spell is

cast in the dreams. The woman dreams about the man and becomes curious. She begins to ask her relatives about the man in her dreams and eventually wants to meet him and they court and marry.

In the 1970s, the emphasis on mono-crop, high-yield corn increased the practice of polygamy—corn-filled storerooms fed a larger household for a few years. Healers whose expertise included love spells got a lot of work despite their collective reluctance to use non-ceremonial (hybrid seed) corn. The Wixaritari may have harvested more corn with the high yield varieties of the Green Revolution, but the high yield was to the detriment of a diversity of other foods and fauna that supported a more comprehensive nutrient profile. By the late 1990s, the Council of Elders formally addressed the practice of polygamy by cautioning males who could not economically sustain such large families. The effects of NAFTA and development programs were being felt collectively, and by the 2000s, more males had to migrate out of Nueva Colonia to support their rural livelihoods. The early to mid-2000s was the initial wave of sojourners to the United States from Nueva Colonia as people responded to the higher cost of living. Many of the sojourners were young males in their early to mid-20s who grew up observing older men who were ascended in cargo prestige with multiple wives. Having multiple wives is an indicator of higher dominance in the cargo hierarchy. Simultaneously, the various agency programs recruited women for the cash-hand-out programs. Thus, in the wider Mexican society, policies that altered the economic structure in favor of an industrial class of independent contractor workers over the agricultural sector, in addition to social

programs to eradicate poverty, have influenced gender relations and marriage patterns.

The Wixaritari Sierra Ecology

The Wixaritari mountains are a 4,000 km^2 territory measuring about 35 miles across and 46 miles from north to south (Collier and Quaratiello 2005). An estimated 20,000 Wixaritari live in the mountainous terrain split among three central communities: Santa Catarina (where I conducted fieldwork), San Andres, and Santa Catarina (Liffman 2011). The Sierra has dramatic overlooks. Long stretches of mountain ranges are dissected by rivers that have carved canyons up to 4,000 feet deep, making the 8-10 thousand feet elevation seem more dramatic (Rojas 1993:15). I took treks with local friends walking anywhere from 4-8 hours to get from Nueva Colonia to villages and hamlets located deep in the mountain forests. Walking was the primary source of transportation, save for the few who could afford a horse or mule, but even then, the animals were mainly used to carry supplies. While traversing the single-track paths, it was not hard to notice the varied micro-climates: the cooler temperatures of the Sierra, the daunting humidity of the ravines (*barrancas*), the tropical-like conditions near the tributaries, and the general semi-arid climate that characterizes most of the Huichol mountains.

Figure 8 Overlook from Taimarita to Rawepa. Photo by author, (June 2015)

The road leaving the mestizo town of Huejuquilla el Alto starts as paved with pockets unpaved and becomes completely unpaved after Tenzompa (23 miles from Huejuquilla). Totopika and I were driving home after a supply run to Huejuquilla when he phoned his relations in the US to see if they could wire him money to help his hip surgery recovery. I took the opportunity to ask him what he recalls about the lands along the way home.

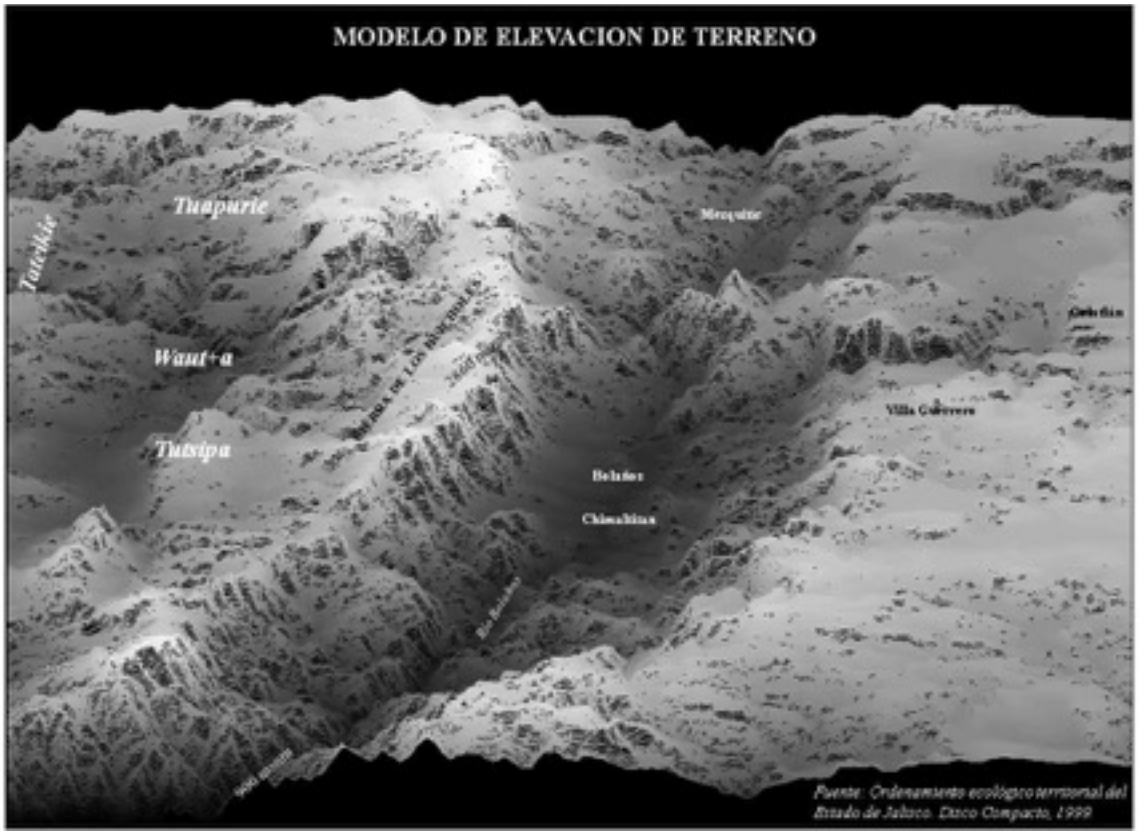


Figure 9 Elevation model of the Wixaritari Sierra. The highest sierras reach 2860 meters. Mezquitic and Bolaños are the two state municipalities that hold jurisdiction over the Wixaritari communities of Tuapurie (Santa Catarina), Wuat+a (San Sebastian), Tutsipa (Tuxpan de Bolaños) and Tateikie (San Andres). Source: Ordenamiento Ecologico Territorial del Estado de Jalisco. Disco Compacto 1999.

Totopika pointed to distant hills around Tenzompa and named them in Wixarika. According to Wixaritari historian Beatriz Rojas, The Chichimeca war [of 1550-1590] was taking longer than expected, so "the [Spanish] crown decided to buy peace" (1993:64). Wixaritari were enticed with money, rations, and promises of ongoing payments if they settled closer to Huejuquilla. Towns such as Nostic and Huajimic were established while Tenzompa and La Soledad were dispossessed from Wixaritari territory (Rojas 1993; Liffman 2000). After many years of wars and land conflicts, President Lazaro Cardenas (1934-1940) signed a resolution recognizing

Santa Catarina's territory, excluding Tenzompa (Rojas 1993:177). A flood of mestizos and extractive industries bombarded Wixaritari lands even after this resolution (Rojas 1993).

Totopika narrated some of this history to me as best he could recall while he admired the fertile landscape Wixaritari used to own. There's an underlying tone of resentment in Totopika's discussion of the Wixaritari who sold out to settle in the towns along the road because eventually, these towns became dominated by mestizo ranchers, loggers, and agriculturalists who moved in to take advantage of land that was relatively flatter and more arable than could be found the Sierra near Nueva Colonia and Santa Catarina. Even more significant was that the town of Tenzompa itself, according to Totopika, used to be a ceremonial center but is now almost completely displaced of Wixaritari, except the ones residing on the outskirts, while the central town is mostly inhabited by mestizos. The Spanish crown declared the lower parts to be surplus land that the indigenous people were not using and thus demarcated Wixaritari territory to the central communities in the sierra proper (Liffman 2000; Rojas 1993). Mestizo ranchers, loggers, and the townspeople pressured the government for decades; consequently, by the 1970s (during the tenure of the Plan HUICOT), the government recognized the territorial boundaries of Santa Catarina as an indigenous community while excluding Tenzompa from indigenous ownership (Liffman 2000).

Figure 10 Tenzompa. Photo by author (June 2015)

We continued our journey, and just outside of Tenzompa a sign marks the beginning of the Wixaritari Sierra. The road right after Tenzompa was recently paved. I recall visiting in 2013, when it was still a dirt road.

"What happened to the rest of the paved road? It looks like they were paving, but they stopped?" I asked Totopika. "The *tewaris* (mestizos) had a project to pave to Tuxpan cutting through the Sierra. But we stopped them." The backers of the project had a falsified document with Wixaritari authorities' signatures. Wixaritari authorities from Santa Catarina found out and immediately stopped the project, including sponsoring an environmental impact report by hiring young biologists from Mexico City. The local mestizo ranchers claimed they wanted the road to transport their

cattle, but the Wixaritari contended that the route was really built to access mining prospects. For instance, in 2012, mining representatives offered the Council of Elders at San Sebastian USD $3 million to purchase land that was discovered to have uranium deposits.[10]

After the sign, the change in the texture of the road and the speed with which we can drive are immediately apparent. There are steeper mountains to climb where jagged-edged rocks line the dirt road to the point of making our journey a slow and bouncy ride. “You think I need a 4x4 to climb this?” I asked Totopika the first time we drove it together as my little pick-up struggled. “Your truck is fine, just go slower and keep it in low gear,” he responded. I slowed down to six miles per hour for at least another hour until we arrived at a patch that is all dirt.

Figure 11 After Tenzompa, sign for the entrance to the Sierra Wixárika. Photo by author (June 2015)

[10] https://www.jornada.com.mx/2012/08/11/oja-sierra.html

Describing the road and the towns is essential when considering the state's role and official relationships with Wixaritari. The paved roads demarcate and clarify that the good, arable indigenous lands were dispossessed to mestizos while the Wixaritari were displaced to mountainous ravines deeper in the Sierra. Such topography makes it challenging to grow traditional *coamil.* When villages like Nueva Colonia were established with state infrastructures such as schools, small stores, clinics, and electricity and potable water in the 1970's with Plan HUICOT, Wixaritari children could attain an education, and eventually, a professional class of Wixaritari emerged. Some of them became lawyers who are currently working to protect their sacred sites. Others live in the cities advancing their collective rights through urban grassroots and professional organizing.[11] I met Wixaritari who worked in construction, as teachers, as accountants, and as engineers, besides the more common roles of subsistent farmer-migrant. Many double in life as musicians, bead workers, yarn-painter artists, or healers. Rarely did I meet a Wixarika man who only did one thing to earn money. Their facility to learn and master instruments, art, and music vocations and bring those expressions into their own cultural forms is both admirable and a trait of their resilience. Music groups such as El Venado Azul projected their music nationally beginning in the early 1990s and by the 2000s grew an international following with tours around the world. Wixaritari artists' ability to project to the world their cultural expressions communicates a collective vision of

[11] See (Negrín 2019)

their role as a people inhabiting this planet and within the wider universe. Virtually every scholar who has studied Wixaritari cosmology has described how they maintain a balance of earth forces and keep the planet in right relation with the universe, and how this is their primary reason to make their pilgrimages and protect their sacred sites (Neurath 2000; 2002; Schaefer and Furst 1996; Téllez Lozano 2014).

Wixaritari and the State

Several state institutions have a direct municipal and regional jurisdiction over the Wixaritari community. These overlapping state jurisdictions have been the source of historical tensions, and remain so in the present. Several states intersect with the mountainous Wixaritari home communities (Jalisco, Nayarit, and Durango); important sacred sites include the states of San Luis Potosi and Zacatecas. As mentioned before, several Mexican municipalities also share jurisdiction, often with the same Wixaritari community. Mezquitic is the municipality that Nueva Colonia, Santa Catarina, belongs to. In October 2015, Mezquitic's election had three indigenous (and no mestizo) candidates; for the first time, elected a Wixarika mayor, Misael de Haro, grandson of the famous Wixarika leader Pedro de Haro. One of his campaign promises that he reiterated in his first address as mayor was to resolve the land dispute that plagued the northern boundaries near Huajimic. This was the dispute between mestizos and Wixaritari (which opened this dissertation) that had cost the lives of three Wixarika leaders. The historical pattern of municipalities vying for land remained. De Haro had good intentions, but Bolaños, the other municipality claimed

a part of the land, and the state of Nayarit, which was involved in a conflict over another piece of land, combined to delay land restitution.

Municipal jurisdiction from outside Wixaritari land has legal authority over law and order inside Wixaritari communities. Even as Wixaritari *agencias* and *rancherias* largely govern their territories, they defer to outside municipal authorities in criminal matters.

The state (Jalisco, Nayarit, Zacatecas) applies jurisdiction in the region by supervising municipal elections every three years (Weigand 1992).

Wixaritari and the Federal Government

One of the leading federal agencies well integrated into Wixaritari life is the Comision Nacional de Desarrollo de los Pueblos Indigenas (CDI-National Commission on Indigenous Development). The name was changed in 2003 from the Instituto National Indigenista (INI-National Indigenous Institute). Similarly, development programs like Plan HUICOT are implemented from the federal level. As mentioned in the introduction, Plan HUICOT was responsible for building infrastructure, training local teachers, and maintaining services such as education, health clinics, farm credits, stores, roads, airstrips, veterinarian services, and radio communication (Weigand 1992:136). When Plan HUICOT introduced schools, Wixaritari initiated educational committees within their *cargo* system to work directly with federal agencies to develop and maintain schools built in Wixaritari communities (Weigant 1992).

Anthropologists have written about the relationship between Wixaritari and the nation-state in terms of territoriality (Liffman 2011; 2000; Liffman and Coyle 2000; Coyle 2000). Territoriality "includes formal rights, popular concepts…and everyday practices of placemaking and controlling physical and discursive space to confer identity, belonging, and power" (Liffman 2011:19). Through major development programs such as Plan HUICOT, the Federal government has constructed the "Sierra Huichola" as a political space. Wixaritari contend with this political space by either pushing against it in land disputes or by adopting it when claiming rights and services from the federal government.

Development Programs, Women, and Food Ways

The traditional *coamil* method of agriculture is widely documented (Coyle 2000; Vargas Martínez 2001; Maldonado 2001; Chavez Benicio 1983). *Coamil* is a Nahuatl term meaning "*huerta con arboleda*" or plot of vegetables (Chavez Benicio 1983: 16). The Wixaritari term for *caomil* is *huatzia* and is characteristically a method of agriculture that uses rudimentary tools such as a planting stick or a plow, no machinery, and includes the following activities: *Roza* or *tumba* (slash), *quema* (burn), planting, and *deshierbes* (de-weeding) manually or with chemicals (Chavez Benicio 1983:17). A planting area is used no more than a few years in a row before it's allowed to rest or go fallow (*barbecho)* (Chavez Benicio 1983:18). *Barbecho* is possible when there are sufficient lands because fields are given anywhere from 3-8 years of rest (Chavez Benicio 1983). The hybrid form of agriculture I saw in the

Sierra was a mix of the ancient practice of *coamil* intended for small-scale family operation and introduced industrial chemical agriculture elements. This form was small scale and aimed primarily at domestic consumption; it required the ability to be mobile during fallow periods and drew upon cooperative laboring among neighbors. Family participation was required at all production and ritual practices, and diversity of seeds and crops ensured balanced nutrition and sustained the family unit until the next harvest. With the Mexican agrarian reform of the 1940s and 50s, which accelerated land dispossessions (as mentioned above), and with the arrival of Green Revolution technologies in the 1970's, people became more dependent on chemicals. Herbicides and fertilizer helped replace the fallow period and did not call for as much cooperative labor. Family labor has become less available because young men and women who would otherwise help have turned to migrant labor. In the case of women in Nueva Colonia, their participation in multiple development programs conflicts with the time they can dedicate to their family plots and maintain their local foodways.

During the time I conducted fieldwork in the Sierra (2015), I interviewed and observed people practicing such as a hybrid form of agriculture: they combined traditional small-scale *coamil* practices with the use of herbicides and fertilizers introduced during the Green Revolution. The use of herbicides didn't prevent people from describing what they did as *coamil,* because herbicides were accepted as a necessary step given their current social conditions. I argue that the hybrid form of *coamil* that incorporates agrochemicals has serious consequences. In addition to adverse health and environmental outcomes, the new hybrid *coamil* undermined

social relations. The emphasis on high yield and the adoption of market-based ideas created a sense of competition instead of cooperation among neighbors. People in Nueva Colonia live in extreme poverty and mobility to cultivate new land and allow other lands to fallow is a luxury. Fields are no longer allowed to go fallow as they were before chemicals came to be used widely. The effects are years of intense use of chemicals on the same plots, causing weeds to become ever more resilient, leading to increased use of herbicides. Thus, the use of chemicals breeds chemical dependency.

Figure 12 Muvieri using a plow to prepare the field before planting corn. Photo by author (April 2015)

A discussion I had with the elder Milia Hernandez Garcia illustrates how this chemical dependency was fostered. We were sitting in her kitchen, the fire heating tortillas cast and casting light from behind her as we discussed the intricacies of corn

production. She emphasized the importance of corn to Wixaritari identity: a mother chooses names for her children based on the myriad of corn cultivation stages. There are male and female names for the same steps. I asked her to describe the process of how corn is grown and then how different producing corn was in her younger years. To the first question, she described the ceremonial preparations and how the entire family is involved in the preparations from beginning to end. She continued describing the *roza, tumba, y fuego* process to prepare the fields starting as early as the first few months of the year. She explained how the entire family helps and how her father was happy when he was practicing *huatzia*, the Wixaritari word for the Nahuatl word *coamil.* She went more into the practice of *huatzia* as a food system that produces nutritious food, social relations, and a sense of wellbeing.

Then she remembered the time when fertilizers were introduced. She says that when they started to be used, they weren't necessary, yet surrounding villages adopted them quickly because of the promise of higher yield. The people were lured by agricultural technology, plus the first few times they used chemicals, they were free. She explained two things key points: First, regarding fertilizer, she said, "Once you use it, you get used to it." She said it made people lazy. We discussed the idea of dependence for a while and agreed that when the state strategically tries to help, it sets up a dependent relationship with locals. The strategy of giving the first chemicals for free got both people and the soil hooked. She explained that the second problem with agrochemicals, especially herbicide, was that "It burned the squash plants, tomatoes and anything else you grew that was more delicate than corn." She also

stressed how it worried her to think of the health outcomes. “I remember we used to grow a lot of *quelites* (pigweed), *jitomate* (tomato), and other vegetables. Herbicide burns vegetables, so I don’t see people growing them as much. They end up buying those supplemental vegetables in the local stores.”

When I asked whether she uses agrochemicals, she said, “I use fertilizer in the *tzeuri* corn [hybrid] but not in the *teiyari* corn [native]*.”* I asked her, “Is *tzeuri* corn hybrid corn?” She responded, “*Tzeuri* corn was introduced from the Tepehuanos. It’s blue and red corn. It’s a seed that grows well in high elevations like the Tepehuanos are used to.” I had heard this response from other elders. When Wixaritari settled in Nueva Colonia, they needed corn that would grow successfully, so the solution came from Tepehuanos in the nearby Sierras. She continued, “The hybrid corn is the white corn. So, I use fertilizer on these corns because if I don’t it doesn’t grow so good. The *teiyari* corn is sacred, and I don’t use a fertilizer with it.” Despite her answer and others who said they didn’t use agrochemicals on temple corn, I personally saw them use agrochemicals days later when I’d walk by as they cultivated their plots with temple corn.

The social programs by the Mexican state tried to compensate, with conditional cash, the indigenous sectors of the population considered incapable of being competitive. Indigenous people collectively own their property and not entirely participating as consumers in the global market economy. The state and agency programs were the strategy to transform members of otherwise collective ownership of land and resources into individual competitors of each other and making them

consumers—modernity through consumerism. A paternal standpoint views a vulnerable population as needing protection from starvation while providing a means of acquiring a capacity to participate in the market as producers and consumers. The message the state was sending to indigenous people was that they didn't need to leave their hamlet villages to purchase Coca Cola and Nestle products or agrochemicals.

In the decade of the 1980s, Mexico went through a structural adjustment with neoliberal measures. Economic policies were implemented to stimulate market competition and competitiveness. One of the significant adjustments that affected the indigenous countryside was to open it up to the global market but also to spread the ideology of competition among the people. When money began to filter into indigenous communities, it altered the social relationship between otherwise collectively-minded communities into individually-minded members (Collier and Quaratiello 2005:107).

In the late 1980s into 1994, during the Salinas administration, social policies were carried out by PRONASOL (Programa Nacional de Solidaridad, National Program of Solidarity), which funded small enterprises in rural areas. The program was accused of corruption and running clientele relationships between local leaders and the PRI party. In 1994-2000 During Zedillo's administration, the PRONASOL programs were replaced by PROGRESA, *programa de education y salud*, or education and health. This program added a feature to the earlier PRONASOL. The different approach was implementing mandatory medical monitoring and measuring

child and maternal health as part of the conditional cash transfer (CCT) program it had established in its earlier iteration of the program.

The name of the program changed after each administration. PRONASOL was renamed and is now called OPORTUNIDADES, but its emphasis on child and maternal health continues. In 2012, the number of individual beneficiaries reached 6.5 Million. OPORTUNIDADES[12] gives cash directly to households classified as being under the poverty line, giving money now to mothers. All the members of the household must undergo periodic medical check-ups and screenings. Pregnant women, children, and the elderly are asked to go more frequently. Children between 5 and 18 have to attend school and report their grades to the program. If they fail or have truancies, the household is penalized. The family receives about USD 50 for each registered adult plus each registered infant under three years of age, another amount for each registered child in school, and another for each elderly adult. The amounts are relatively small, $25-75 for each category. The money is typically dispensed monthly. For example, a mother gets about $50 for a registered child per month to be spent on school-related supplies.

In Colonia, it's obvious when OPORTUNIDADES is handing out money. Vendors line up along the dirt road in the middle of the village. The feeling is like a festival, with the vendors staying several days. Women go from the office in the

[12] https://datos.gob.mx/busca/dataset/mexico-incluyente-estadisticas-nacionales/resource/1464c050-73ea-4516-af07-f2997b0c094d and https://borgenproject.org/mexicos-oportunidades-program/ accessed October 20, 2020

presidencia, where the money is handed out to the vendors: food, clothes, household items, school supplies, trinkets, and plastic toys.

OPORTUNIDADES has a gender equity target, promoting women heads of households termed *titulares* by means of the small monetary grants they receive directly from the program. At about $50 a month, a woman in Colonia could participate in as many as five separate programs across three agencies: national, state, and another set of programs run out of the Committee of Indigenous Development (CDI) in Mezquitic. These programs promote a type of citizenship participation by having women manage their own money. This money is supposed to go to medical and educational involvement and documentation of household health.

Also, to be registered as *titulares*, some women, usually identified by their ability to read and write, are asked to be *vocales* (representatives). Vocales announce policy changes and when money will be dispensed. From the interviews I conducted with several participants who, at one point or another, were asked to be *vocales,* I learned that the position was unpaid.

Licha, who runs the restaurant, told me a story about how she felt placed between the program and the women in her community. OPORTUNIDADES pressured her to be a *vocal.* Despite telling them she didn't know how to read and write, they insisted she be a *vocal* anyway. She acted as representative of the program for 10-12 *titulares.* After several months of work and meetings, she realized the position required more than communicating information to the women involved in the program in her area of Colonia. Program officials started asking her to do logistics,

including handing out *titulares'* money. Everything, she said, was aimed at keeping the program field officer from needing to be in the Sierra so much.

In meetings, Licha felt confused and uncomfortable with a role she was expected to perform, yet she did not want. On the one hand, she was encouraged when reminded that her restaurant was a great project funded by the social programs. On the other hand, program officials made her feel inferior for her lack of formal education. Meanwhile, she started to see how the *titulares* were seeing her differently, as if she *were* getting paid by the program. It created a tension that turned to mistrust among her friends she had known for many years. Eventually, she quit the position of *vocal*.

Another program, *Piso Firme,* or firm ground, was involved in projects having to do with the act of pouring concrete: walkways, sidewalks, and the problematic underground cistern toilets. The representatives of this state program also approached Licha at the restaurant. Licha said she felt pressured to practically work for free making food for the workers of *Piso Firme*. The meager 200 Pesos to feed a crew of about 25 workers for three weeks ended up hurting her business. Her other customers had to be turned away while she was tending to the *Piso Firme* workers. The restaurant has two small tables to sit eight people. The crew of workers had to be served in three waves twice a day. Her restaurant began with seed money from the social programs, and she felt pressure to say yes, but it was exploitation. She was losing money. She completed the three weeks but decided she would never agree to doing it again.

I asked her if she went to Piso Firme officials with this issue to resolve it, but she told me that she was too intimidated to ask them because she knew they had the power to influence closing her restaurant. She also feared she could again lose the monthly rations she received in the other programs like PROGRESA that had a cash allowance each month to support her children attending school. Licha explained that other women complained about being shamed and explicitly told to do more exercise on the stationary gym PROGRESA hauled to Nueva Colonia. After years of racist and degrading treatment from government development programs, people couldn't take it anymore. On September 22, 2015, people from Nueva Colonia and Santa Catarina descended on CDI offices in the head municipality of Mezquitic. *Comuneros* and local leadership from Santa Catarina demanded accountability from governmental basic needs programs. Their main issue was the "Mismanagement of basic services and programs that, over time, become problematic when not resolved….We march to the city of Guadalajara to demand justice in the face of social inequality."[13]

Piso Firme installs underground cistern style bathrooms. In other words, they dig a hole, install a cistern, pour concrete for an individual toilet, and build a tin shack with a roof over it and a door. They established several around *Colonia*. You can smell them from afar when the cistern is full. The program is supposed to send a truck with a vacuum that sucks out the cistern's contents and drives it away. Even though

[13] https://www.milenio.com/estados/huicholes-tomaron-las-calles-de-la-cabecera-de-mezquitic (accessed july 2, 2020)

these toilets had been installed several months before I arrived in Winter of 2015 no one had come to empty them even six months into my fieldwork. Piso Firme also poured the cement to install an exercise machine. When women would walk several hours to make the required meetings, field agents of other programs would tell them that they were overweight and direct themselves to the exercise machine.

Licha and her contemporaries have pushed back against the top-down, patronizing model of the agency programs. Besides, they've organized their own local events. While I was conducting fieldwork, I observed them manage International Indigenous Peoples' Day and workshops on medicinal plants and local ancestral foods. Sometimes by working with clinic health promoters, they organized events like *Semana de Salud*, health week. In the event, the women got together in the *presidencia* (town hall) to lay out plants on a table that they had collected and exchanged ideas about medicinal uses of local plant varieties. According to Licha and other women I interviewed, like Muvieri's wife, Maria Elena, the most important thing they provided each other in those events was the neutral space for each other to bond. It's important to note that the women's groups do not develop in response to welfare programs but through the cohort of temple *cargo* appointments; women's group participants are chosen along with their husbands and become *compadres* and *comadres*. Yes, they are all enrolled in one government program or another. But what glues them together as a women's group is that they are serving or have served cargo positions in the temple as a cohort.

A salient issue that I noticed interviewing women was how the state programs took their time and bodies away from familial commitments such as engaging in the *coamil* or their foodways. Muvieri's wife, Maria, who participated in five state programs that helped women agreed with Licha. Both Licha and Maria expressed frustration with the state programs' requirement to attend each program's meetings to remain in good standing. "It's like a job to participate in the programs because of the meetings and workshops we must attend to get the benefits." On the one hand Maria admitted that the benefits helped her to get by from month to month, but only barely.

Meanwhile, she tried to balance her time with family commitments in the *coamil,* making food, raising her kids, and participating in ceremonial life. And therein lies the issue with how women are being constrained to an extent that their labor is reduced to state program-related functions while they have to juggle their time to respond to other obligations. This has more considerable consequences for undermining the critical role that women play in cooperative labor in the family *coamil*, in *cargo* commitments, and in neighborly cooperation.

Cooperative work has been written about by many anthropologists. Margaret Mead (1937) writes about cooperation among "primitive people," and her argument stresses the importance of building relationships among individuals as being more important than the cooperative work goal itself. Anthropologists writing about Mexico have similarly identified a widespread practice of collaborative community work called *tequio* among indigenous groups (de la Fuente 1944). Although it can be compared to the work required to carry out cargo positions, *tequio* is a more general

term that can refer to any situation in which individuals cooperate, but in terms of its institution, scholars refer to it as part of civic structure (de la Fuente 1944; Cohen 2010). *Tequio* obligations, like other *cargo* obligations, can be undermined by involvement in the market economy. For example, Jefferey H. Cohen (2010) describes a community in Oaxaca where villagers pay money instead of cooperating with labor. But what happens to institutionalized community work when state programs coopt bodies and time through state programs and their obligations? State programs, which increasingly target women, have individualized time and labor such that women have to prioritize what time they have left, and they begin to avoid *tequio*.

The women I interviewed who participated in multiple state programs felt the constraint of time and the dependence on the conditional cash-outs to make it through the month. Each program provides a small benefit, and women enroll in multiple programs to supplement their needs. Meanwhile each program demands their time and logistical requirements that hinder involvement in more familial and collective cooperative labor, especially around food ways. The case could be linked to a medical anthropological study in Guatemala on how social processes affected nutritional epigenetics, specifically obesity (Yates-Doerr 2015). Yates-Doerr's research traces the emergence of obesity in the Guatemalan highlands to social factors that her interlocutors expressed about a fast-paced life where food no longer was prepared and consumed collectively. At the same time, society stressed a technological approach to

diet and calories to remedy the increased health problem caused by policies like the Central American Free Trade Agreement.

Similarly, Mexico, including the Sierra Wixaritari, was bombarded with an influx of processed foods via NAFTA and after years of development through consumerism, Mexico is experiencing a diabetes epidemic (Gálvez 2018). The clinic doctor of 13 years in Nueva Colonia, Dr. Carmen, told me that "Women's waist size has grown as they have grown dependent on state handouts and are less active in the fields." Yet, this method of assessing any one of the metabolic syndromes (diabetes or obesity) falls short of looking at the real problem. Reducing systemic health outcomes to a matter of personal choice failed to look at the policies and developmental programs that had direct influence on peoples' diets (Gálvez 2018).

Chapter 3 Summary

This chapter began by describing the regional version of the Green Revolution in the Sierra, the Plan HUICOT, an all-encompassing development program that introduced the first chemicals to Nueva Colonia and Santa Catarina. It was the first for many things: airstrips, clinics, stores, schools, roads, and agricultural chemicals. Nueva Colonia grew in population as the schools and clinics were strategically placed near a road.

Wixaritari occupy lands recessed deep in the Sierra and varied in climate and features. The *tewaris*, neighboring mestizos, have appropriated the flatter, more fertile, and more accessible lands historically owned by the Wixaritari. The region has

a history of constant wars and legal battles, and many remain—Wixaritari fight to protect their way of life on various fronts and from state and federal governments. Meanwhile, development programs target women with market-based ideas about individuality, food, medicine, and, most importantly, household labor. The demands of programs that seek to change womens' behavior with small cash hand-outs keep women in meetings and prevent them from doing other kinds of work. Poverty programs like "PROSPERA" incentivize women to fulfill program goals for medical and educational benchmarks while increasing the ability to spend cash outside the previous informal economy of reciprocity. Even as these conditional benefits programs were getting underway, NAFTA undermined local foodways by removing corn production subsidies. Mexico was seen as a site for low-cost *maquila*-style industries on the US/Mexico border, increasing migration away from a rural agricultural sector that the government saw as no longer viable. Development programs and changing agricultural systems put demands on women's labor away from ancient foodways and collective labor to produce milpa-style cuisine that pushed people to change their diets and labor practices, resulting in adverse metabolic conditions (Gálvez 2018).

Conclusion

This dissertation addresses key intersections of toxicity, epigenetics, and indigenous governance toward protecting sacred sites. In my examination, the stories in each chapter amplify my analysis in the following ways. The land dispute in Huajimic that introduces this study is one of the numerous land disputes to which Wixaritari have expressed a sense of warfare from being bombarded in all directions from mestizos to corporate-government megaprojects. The experience of spraying herbicide with the Wixaritari family I lived with during my 2015 fieldwork exemplifies generational dependency on agrochemicals. The ingenuity of the ancestors of the Cora, Tepehuano, and Wixaritari people of El Gran Nayar region was developing food systems over centuries that flourished in the varied micro-climates and geographies. Unfortunately, decades of regional agricultural and economic development programs since the agrarian reform of the 1940s and the structural adjustments made through NAFTA since 1994 have undermined local foodways and imposed a market-based ideology to solve the region's problems. Subsequently, the local refrain that Paulino shared about instant ramen noodles as the devil that destroys the community offered crucial insights into processed foods as a lens through which to see exposed bodies and toxic landscapes. The ethnographic experience helped to guide my study of the epigenetic implications of poisonous environments and to engage with local ways of understanding the exposure. The intersections of development policy, food, and chemical exposure form the basis to contextualize the epidemic of metabolic syndrome in Mexico as I expand outward from Nueva

Colonia, Santa Catarina to similar concerns across the whole nation. Medical anthropologists have used environmental epigenetics to account for the social processes and racial inequalities that contribute to adverse and unequal burdens of disease outcomes (Lock et al., 2015; Landecker 2011; Guthman and Mansfield 2013). This work contributes to critical medical anthropology that deals with bodies, environment, and toxicity using the lens of environmental epigenetics premised on the social determinants of disease etiology.

In Chapter 2, the stories of Totopika and his son's cargo commitments illustrate how Wixaritari obsess over fulfilling their temple duties despite being poor and, in Totpika's case, recovering from hip surgery. The cargo system of hierarchy is extensively documented in the anthropological literature. My contribution is to show how Wixaritari mediate conceptions of sickness and healing with the help of their healers, *mara'akame,* and by successfully fulfilling cargo positions. Wixaritari religious cargo positions get their structure and role from a cosmic worldview mapped in a vast network of landscape temple sites. The other contribution I am making is to show how Wixaritari adapt their cargo positions to address land disputes and proposed megaprojects in their territory.

A recent example is when Wixaritari lawyers and local leaders established the *Consejo Regional Wixarika por la Defensa de Wirikuta* (*Consejo Regional Wixarika* or CRW) to address the 2010 mining concession in the Wirikuta desert. The Council of Elders is the highest authority in Wixaritari communities. The council worked closely with CRW to have the agricultural cargo committee positions of each

Wixaritari community report to CRW to help address the multiple land disputes and megaproject battles. The agricultural committees are a relic of the 1940s Agrarian Reform in Mexico, and people complained that they didn't do anything. Thus, whereas Wixaritari historically relied on mestizo brokers to lead past resistance movements, the current resistance movement is led by CRW. The rank-and-file consists of the existing agricultural committee *cargo* positions. The protection of sacred sites is not merely a battle of saving the environment but also a matter of attending to the wellbeing of each other, including non-human landscape deities.

Chapter 3 lays out the material history of how chemicals and processed foods entered the region via development programs, namely, the Green Revolution and NAFTA. Despite development programs' intentions to curb poverty and malnutrition, the programs created the conditions for today's dependent relationship. Local women are primarily targeted by agency programs. They are recruited as communicators of their household's health information for the state apparatus of health information gathering. In return, programs provide conditional cash to purchase educational and health supplies for children. The problem is encapsulated in what Charles L. Briggs refers to as notions of "communication" or communicability (2005). Knowledge and information are gathered on unequal terms. The control over the production, circulation, and reception of discourse "stands alongside racialization, medicalization, and other power-laden processes as integral to schemas of hegemony, coercion, and violence" (2005:270). Applying Briggs's concept of "communicability" to Wixaritari women, we see how they provide a flow of health information in a process structured

by inequities of power and resources (Briggs 2005). Moreover, agency programs and their partners construct racialized ideologies about Wixaritari community health. As I will demonstrate later in this conclusion, another place "communicability" is applicable is in the biotech-government partnerships that gather genetic information, privatize it, and use it to manufacture "ethnic" remedies to solve the diabetic epidemic.

Wixaritari women I interviewed participated in as many as five development programs. Women reported that programs required meetings and workshops that conflicted with family and community commitments of collective labor. The programs incentivized dependency. Multiple enrollments created a false sense of employment. Also, women surviving the experience of poverty become embedded in programs that position them as the solution to poverty by providing market-based ideas about personal responsibility and better consumer choices. The programs' names reflect the hubris of the top-down approach: *Progresa*, *Prospera*, *Oportunidades.* These terms insinuate that participants are not prospering and the state will provide the opportunity to progress. Licha's stories point to how development programs take advantage of women's labor by using her restaurant to feed the mestizo workers hired by partnering developmental agencies. Many of the Wixaritari women whom I interviewed and observed resigned themselves to participate in multiple agency programs that create the illusion of partial employment as they receive conditional cash handouts and basic food rations. To maintain their standing in programs, women are obligated to attend meetings and fulfill program

mandates that often posit women as the state agent and de facto head of the household for their families.

Meanwhile, as women are busy working as de facto agents of development programs, they become less available for domestic food production. In this transformation of time and obligation, the consumption of processed foods goes up in addition to the growing reliance on agrochemicals. Woman's labor is central throughout Mesoamerican food systems. Development programs have thus replaced women's labor with cheap and toxic foods and agrochemicals. In the following sections, I review how my dissertation research engages with broader theoretical analyses and scholarship concerned with structural adjustments, development, and increased exposure.

Embodied Chemicals and Environmental Epigenetics

New understandings in molecular genetics since the Human Genome Project (HGP) have ended the debate about genetic determinism (Moore 2015; Thayer and Kuzawa 2011). The shift towards including environmental factors resolved old debates about nature/nurture. The epigenome includes epigenetic triggers or "variables external to the body that can bring about changes in gene expression or cellular phenotypes" (Lock 2013:291). For medical anthropologists already concerned with the political economy of health disparities and inequities, these discoveries helped usher in an environmental epigenetics approach that sees health outcomes as a product of social and biological processes (Lock et al. 2015; Guthman

and Mansfield 2013). Furthermore, the emerging field of nutritional epigenetics, which considers food as part of the environment, has helped transform scientific understanding about metabolism, the body and environmental exposure (Landecker 2011).

Nutritional epigenetics studies food environments. Three ethnographies by medical anthropologists on metabolic syndrome have helped to guide my understanding of the relationships between food and epigenetics. Alicia Galvez's *Eating NAFTA* (2018) shows how metabolic syndrome was the direct outcome of development policy that increased processed foods consumption and altered relationships to ancient foodways. Her work is about how industrialized foods transformed bodies across rural and urban Mexico.[14] Galvez points out, "NAFTA in Mexico completely restructured health, economy, and other aspects of life by making the marketplace the solution to society's problems," as long as people educate themselves to be better consumers (2018:120). I draw from Galvez's work because her analysis of metabolic syndrome is not merely a question of over consumption of food. Galvez's is clear that NAFTA worsened economic conditions for Mexico's poor and working class. As a result, health outcomes worsened for rural and urban poor and indigenous people. A similar process transpired in the Sierra, and Wixartiari were left to resolve their issues by being better consumers of food and health products. Thus, building on Charles L. Briggs's work on the language of blame and

[14] A more historical approach can be seen in the work of Jefferey Pilcher's, *Planet Taco* (2017) that traces the relationship between globalization, Mexican fast-food and how changing notions of authenticity.

communicability, Galvez shows how corporations shifted the blame (away from the policy) by using language that describes the obesity and diabetes problem as multifaceted and complex rather than about economic policy and structural adjustments (2018:128).

Harris Solomon's *Metabolic Living* (2016) examines how bodies absorb Mumbai's stressors as triggers for *tenshun* (62). I draw upon Solomon's project to think through the idea of pre-existing conditions that layer onto emerging ones. Given Wixaritari multiple land disputes and threats to sacred sites, can we think about the stress of low-intensity warfare in light of toxic landscapes and processed foods?

Finally, Emily Yates-Doerr's *The Weight of Obesity* (2015) examines the changes in food systems and public health responses to metabolic syndrome in Guatemala after CAFTA (Central American Free Trade Agreement). Yates-Doerr's analysis argues that measuring and quantifying the body is incommensurate with local conceptions of the body. She also addresses the neoliberal idea of individual possession and market-driven ideas. The new stores and business parks that sprang up in nearby cities also brought fast-foods while drawing labor from rural towns. I draw from Yates-Doerr's examination of the reductionist view of public health to define metabolic syndrome (diabetes and obesity) as mathematical endpoints resulting from individual food choices and not policy and social processes.

The problems are twofold, one, an assumption of a universal body responding to measurements of inputs and outputs and a body that is ahistoricized and divorced from racialized ideas of normal and abnormal. Yates-Doerr shows how the public

health system's response to the diabetic epidemic in Guatemala perpetuates adverse health experiences for vulnerable populations by reducing the metabolic problem to a series of individual decisions around nutrition and exercise. Yates-Doerr's critical medical anthropological approach shows how her interlocutors' decision-making is impinged by a changing lifestyle where people no longer have time to procure, prepare and enjoy food collectively and instead must eat individually because family members migrate into the city to find work.

Similarly, Wixaritari have to migrate out of the community to sustain their rural livelihoods. The debts incurred while fulfilling cargo positions is a common pressure that is exacerbated by the economic precarity brought about by policies like NAFTA. I draw a link between development programs, NAFTA, and government-biotech partnerships that constitute the market-based reductionist approach to address metabolic disease. NAFTA transformed indigenous producers of food into consumers of food and medicine. As I note below in this conclusion, Wixaritari practices of cargo and healing offer critical interventions to such systemic transformation of local foodways and the harm to bodies by development programs and mega projects. Wixaritari engage in actions such as protests and press events to both control the narrative of their struggle and to address specific agents and institutions that cause harm and discrimination. A common thread among development programs is precisely controlling information and communication of health information of vulnerable populations. The concept of communicability (Briggs 2005) applies readily to two instances where Wixaritari's health information is gathered while they

are closed out of the process of how that information is mobilized to produce products, narratives, or communications about health. One such program is Mexico's Law of Genomic Sovereignty that sequenced the indigenous population's genes to find genetic endpoints to disease to manufacture remedies.

Mexico's Law of Genomic Sovereignty

Two decades after The Human Genome Project in 2001, new understandings of molecular genetics and technologies to sequence genetic data emerged that mobilized new approaches in public and global health. The World Health Organization published "Genomics and World Health Report" outlining population genetic programs combined with public education (Katz and Hofman 2005). The WHO and NIH also launched a U.S. $11.5 million, five-year program for International Collaborative Genetics Research Training between U.S. universities and institutions in countries like India, China, Costa Rica, Thailand, Mexico, and Venezuela (Katz and Hofman 2005). National investment worldwide grew in response to the increased implications of genetic variation for health outcomes and the growing economic value of genetic information in pharmaceutical development (Whitmarsh 2008). Others saw "contradictory tendencies—unifying *and* differentiating a diverse body politic, gathering national scientific and commercial autonomy *and* dependence upon global knowledge networks and foreign capital" (Benjamin 2009:343).

The most notable assertion of genomic sovereignty is the Mexican Senate's reform of the General Health Law in 2008. The global concept that gave Mexico a post-genomic turn to battle the nation's diseases was known as Genomic Sovereignty, which declares that it "is the capacity of a people, a country or nation to own and control the use of samples, data and knowledge concerning or emanating from genomic material" (Siqueiros-García, Oliva-Sánchez, and Saruwatari-Zavala 2013). The law made it illegal to export Mexican genetic material, and it provided for jail time and garnished wages for researchers who failed to get prior government consent (Benjamin 2009). Thus by 2004, Mexico started the Mexican Institute of Genomic Medicine (INMEGEN) with a partnership between private and public partners. Indigenous genes of various geographic regions have been sequenced including Wixaritari (Rangel-Villalobos et al. 2000). Mexico's remedy for the diabetic epidemic is through biotechnology. The discovery of genetic endpoints of diabetes will not solve the social processes of disease etiology. I bring up the genetic debate about sequencing and ethnic remedies to make two points: First, the genetic information was gathered in a process of unequal power and resources that does not favor indigenous people. The information gathered reproduces unequal power relations through communicability, medicalization, and racialization (Briggs 2005). Therefore, genomic sovereignty is another example of an extractive industry exploiting the native population for their blood, labor, and medical surveillance information.

The second point is that studying genes is easier in a post-genomic era where technology has allowed us to sequence and pinpoint genetic markers for diseases, which makes it easy to dismiss environmental factors (Lock 2015). In one of the regional meetings in Nueva Colonia in 2015, the Council of Elders made a declaration prohibiting the appropriation of Wixaritari cultural iconography and ritual information, including video and photography for the purpose of profit and without prior consent. Corporations had been accused of stealing their art motifs to put on shoes and clothes. They also referenced programs that promise to help but end up using the women to gather information while not disclosing what they do with the information. The momentum had already been mounting as Wixaritari and allies marched to the agency offices to protest the discriminatory treatment of their development programs. Instead of helping them resolve land disputes, the state programs of health, education and economic development provide another obstacle in the larger fight to maintain their way of life.

The Wixaritari way of life is to fulfil cargo commitments across their sacred sites to maintain their individual and collective wellbeing. In the section that follows, I describe how Wixaritari mediate cultural conceptions of sickness and healing through the cosmology mapped out in landscape sites from the coast of Nayarit to the desert of San Luis Potosi.

Cargo and Fiestas: Mediating and Resolving Conceptions of Sickness and Healing

The cargo system among Wixaritari helps to mediate conceptions of sickness and healing of the body and the landscape. In addition, healers, or *mara'akame,* help community members resolve sicknesses by interfacing with landscape deities. Everyone in the community performs ritual pilgrimages at one point in their lives. Aside from their religious importance, the Wixaritari civil and religious cargo system is how Wixaritari keep vigilance, care for, and govern their ancestral territory. The landscape sites are also spaces of resistance. The stakes are high; for the governments and partners, the prospect of large profits from gold, uranium, a hydroelectric dam, a nuclear waste dump, and large agribusiness is in legal contention with Wixaritari asserting their right to continue their ancestral practices.

The cargo system in the anthropological literature of Mesoamerica and the Maya region is also referred to as the civil-religious hierarchy, *fiesta*, or *mayordomia* system. The system is defined as a collection of governance positions and religious positions held by individuals and households. It is a defining feature of how indigenous communities govern their societies and practice their religion (Cancian 1965; Padilla-Pineda 2000). Wixaritari cargo is based on their cosmology (Neurath 2002). Thus, cargo is not merely about fulfilling positions and gaining power and prestige. It is also about maintaining wellbeing of bodies and landscapes. Wixaritari model their territory based on the stories of their collective past (Neurath 2000; Liffman 2000). Others have looked at how landscape informs ethics and ways of

knowing (Basso 1996). My contribution to the literature on cargo rests on the understanding that cargo is based on the local cosmology (Pineda 2000). Within the Wixaritari literature on cargo, I build on work that sees cargo as adapting to political currents (Téllez Lozano 2014) such that Wixaritari have been able to keep their territory from being destroyed.

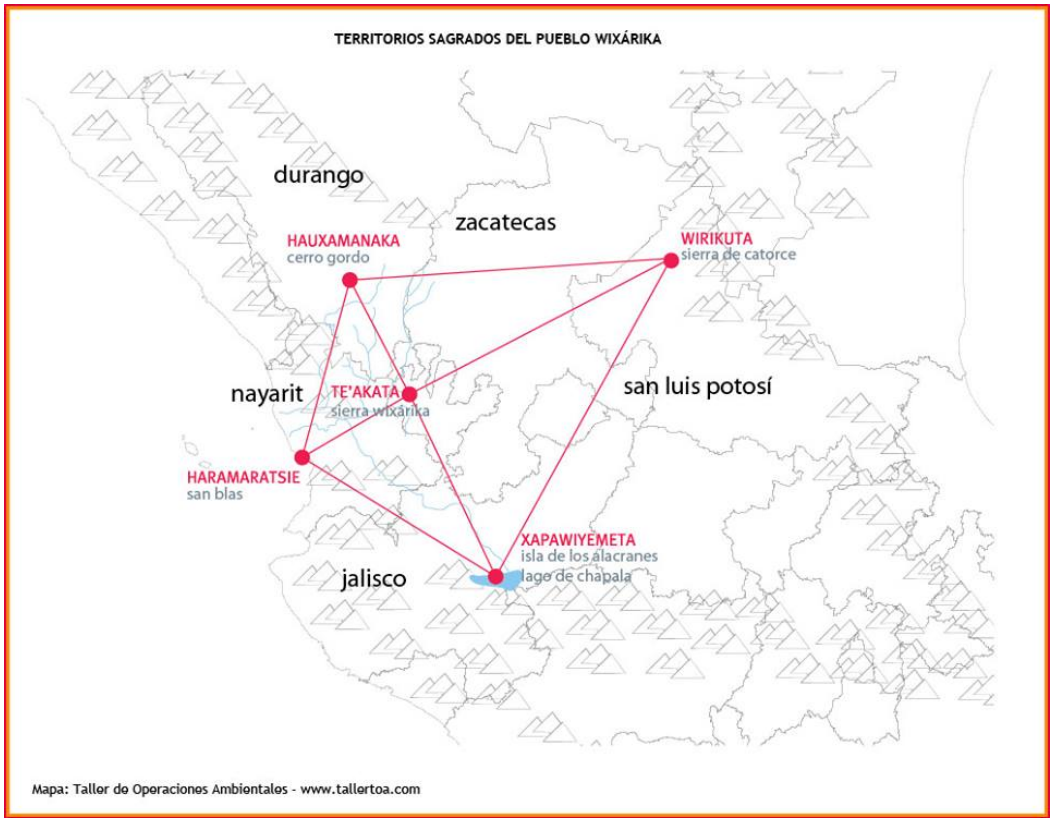


Figure 13 Map of the Kiekari, sacred geography that crosses 5 state boundaries to form a rhombus shape with the center, Te'akata, in the Wixaritari mountainous communities.

The religious part of the cargo is locally referred to as *"la costumbre."* Wixaritari see themselves as caretakers of a vast network of sacred sites from the coast in the state of Nayarit (*Tatéi Haramara)* to the desert in the state of San Luis

Potosi (*Wirikuta)*, and from as far south as La Laguna de Chapala (Xapawitemeta) to as far North as Durango (*Huaxa Manaká*). The four main religious sites make a rhombus shape on a map with the epicenter, *Tee' kata*, Santa Catarina, in the Wixaritari mountains. In addition to the four main deity sites, Wixaritari have smaller temples that house the spirits for common sicknesses such as cough, flu, etc. There are also sicknesses associated with failing to fulfill religious cargos. The consequences of failing religious cargos are varied: random fainting, unexplainable convulsions, body stiffness. In these cases, sickness and healing are mediated by hiring a *mara'akame* who determines the prognosis, instructs the patient to sponsor a "*fiesta,"* and concludes with an offering to a temple determined by the diagnosis.

In other cases, such as that of the COVID19 virus, the *mara'akame* will chant all night in the temple for any afflicted family members. Another role *mara'akame* has is to chant in the temple when the Council of Elders addresses emergencies. In one of my visits in 2013, Totopika invited me to hear him chant all night in Las Latas to chant about a white bug that infected the corn in Nueva Colonia. Similarly, in April of 2020, Totopika was asked to chant all night in the temple for the COVID19 virus.

Pandemic Response

In March 2020, the office of the Secretary of Education stopped sending teachers to the schools in Nueva Colonia, Santa Catarina because of the COVID19 pandemic. Wixaritari protested in front of the schools in Nueva Colonia. The pandemic worsened globally and Wixaritari had to take independent measures to

protect their communities. One case of infection was confirmed near San Andres. It was an older man who had recently traveled to the city of Guadalajara. He was expedited to a hospital in Nayarit by helicopter. Subsequently, *filtros sanitarios*,[15] checkpoints were set up at the entrance to Nueva Colonia. The authorities allowed in people in the community as long as they registered their name and with whom they were visiting. They were not equipped to do much more. *Filtros sanitarios* were set up along state borders to stop people from entering the state unless absolutely necessary. According to Aukwe Mijarez, a radio reporter from San Andres Cohamiata, as of September 2020, the municipalities nearest Wixaritari communities are Bolaños with 19 cases; Huejuquilla el Alto has 13 cases, Mezquitic has 14 cases; the state of Nayarit has 5,000 cases; the state of Durango has 6,000 cases, and the state of Zacatecas has 5,000 cases. No cases have been reported in Nueva Colonia.

The situation on the outside felt precarious as news and radio outlets expressed the potential for a drastic eradication of vulnerable populations if an infection broke out of control. Meanwhile, *cargos* in Nueva Colonia continued to be done. By April 2020, Wixaritari in Santa Catarina performed a ritual to prevent the virus from entering the community, according to Totopika's son Muvieri. Meanwhile, local authorities in Mezquitic expressed concern in the local paper about Wixaritari not keeping physical distance in their rituals.

The pandemic exposed already existing health inequities and systemic racism. Santa Catarina has the largest Wixaritari population at 3,200 people. According to the

[15] Literal translation is "sanitation filter"

president of *Bienes Comunales*, Salvador Agustin Carrillo of Santa Catarina, "About a month ago [July 2020], the State Indigenous Commission brought supplies for 450 people. The rest of the people migrated to earn money working in Fresnillo, Durango, Nayarit, and Zacatecas."[16] Though well aware of the risks that people may return infected, they subsequently removed the *filtros sanitarios* because neither Jalisco nor Mezquitic offered follow-up supplies or information about Covid19 to help them do a better job of containment.

The experience of vulnerability and lack of infrastructural state support is found worldwide among indigenous communities. For example, Charles L. Briggs and Clara Mantini-Briggs's (2003) study of a cholera outbreak among the Warao of Venezuela shows how misinformation via narratives of blame contributes to more deaths. Similarly, Paul Farmer in *Pathologies of Power*, offers four case studies focusing on rural Haiti, Guantanamo, Cuba, Chiapas, and Russia and shows structural violence in the form of commodified health programs that the poor cannot access and how that increases incidences of AIDS/HIV and tuberculosis (2004).

Before the pandemic, Wixaritari leaders and community activists had been building up momentum by marching to the Commission of Indigenous Development offices in Mezquitic for the lack of medical supplies in their community clinic.[17] The protests forced accountability by the federal *Secretaría de Salud* (health secretariat), the state of Jalisco, and the National Commission for the Development of Indigenous

[17] https://www.milenio.com/estados/huicholes-protestan-por-pesimos-servicios-de-salud (accessed 11/03/20)

People who together built a U.S. $124 million multicultural, community hospital named "*Naiti Tetewa Uatiarietse*" in the outskirts of Huejuquilla el Alto in 2016.[18] While the new hospital seems just in time for the pandemic, the clinic at Nueva Colonia is ill equipped to serve its one thousand residents, which is one of the main reasons Wixaritari protested for years to get a community hospital to serve the region. The community hospital is intended to serve the 128,000 indigenous people of the Gran Nayar region. The project made concessions for a pluralistic medical approach that welcomes the beliefs and practices of the indigenous people of the region—local practices such as bone setters, massage therapists, midwives, herbalists, and of course, *mara'akate*.

[18] https://www.milenio.com/estados/inauguran-hospital-multicultural-en-huejuquilla

Figure 14 Multicultural Community Hospital built and opened in 2016. Photo by Nueva Colonia Facebook page

Muvieri's wife gave birth to their third child in the community hospital. He said they provided good attention except for the long registration process. The visits are free, and the prescriptions are subsidized. I visited several community hospitals in various rural and urban localities when I was in the field. The community hospitals serve the nation's poor who do not have formal employment or cannot afford the social security platform or IMSS (Instituto Mexicano de Seguro Social). IMSS costs about $45 per month for voluntary enrollment for people who do not have health insurance paid by formal employment. As of January 2020, Mexico replaced the *Seguro Popular* (Popular Insurance) with the INSABI (Instituto de Salud para el

Bienestar, Institute for Health and Wellbeing).[19] INSABI is intended to provide access to medical care to all Mexicans who cannot afford IMSS, which by 2014 numbered 55.3 million people in poverty conditions.[20]

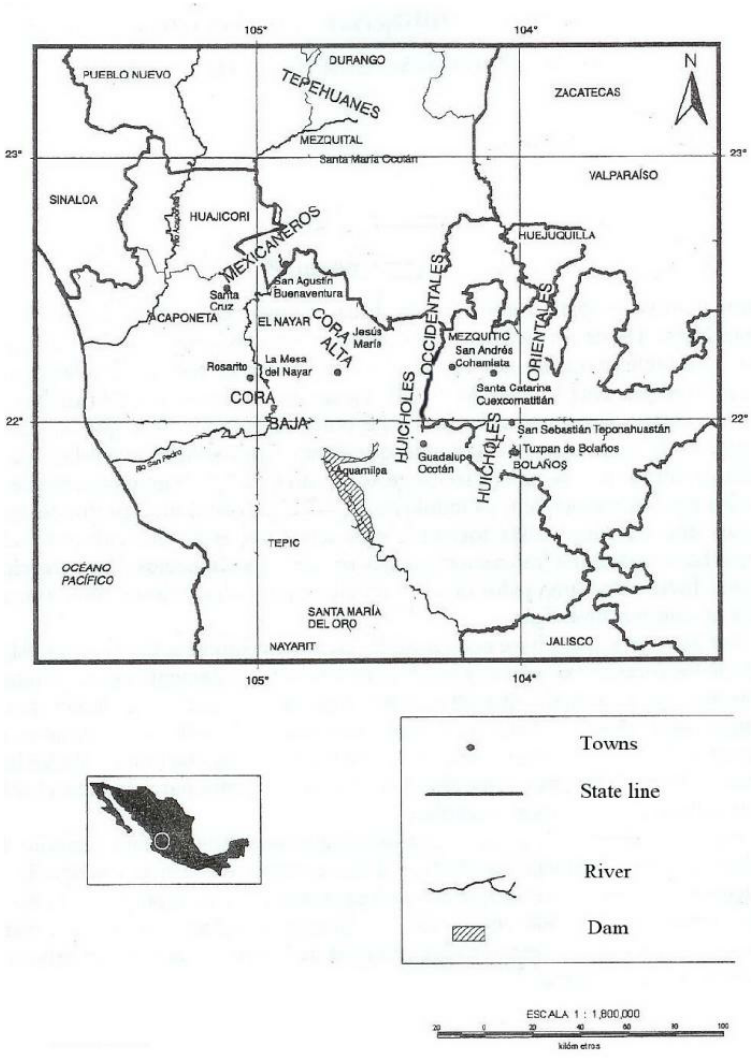


Figure 15 El Gran Nayar's peoples: Mexicaneros, Coras, Huicholes (Wixaritari), Tepehuanos (Neurath 2003:42).

[19] https://www.gob.mx/insabi#9522 (accessed 11/08/20)
[20] https://www.coneval.org.mx/Medicion/Paginas/PobrezaInicio.aspx (accessed 11/08/20)

Returning to the underlining premise of this study, Wixaritari landscape practices are simultaneously sites of resistance and sites of toxic exposure. Post-genomic sequencing technologies helped usher in an epigenome that is responsible for mechanisms of environmental factors reflected in genetic markers termed "epigenetic triggers" (Bonasio, Tu, and Reinberg 2010; Thayer and Kuzawa 2011). I have identified and historicized social processes in Mexico and the Sierra that have increased the chemical vectors via agricultural chemicals and processed foods that are implicated in adverse health outcomes. Mexico is experiencing an epidemic of metabolic diseases in diabetes and obesity that have been linked to the consumption of processed foods and worsened by ongoing social stressors and toxic exposure in the environment (Solomon 2016; Yates-Doerr 2015; Gálvez 2018).

In the Wixaritari Sierra, the epigenetic triggers are historically linked with colonial mining, Green Revolution agrochemicals, NAFTA and the discriminatory experience of being of indigenous heritage. Locally, the concept of development has been viewed as "destruction" to which Wixartiari have re-oriented their agrarian cargo positions to address both extractive projects and the lack of medical supplies in their territories. Wixaritari care and govern themselves and their ancestral landscape through cargo commitments, where stories of their place in the universe link past, present, and future with a sense of stewardship and a source for healing as *mara'akame* mediate with their patients along with the vast network of landscape sites. However, the region finds itself in a precarious situation with added

vulnerabilities and where the protection of territory has escalated to violence. While their fight to practice *"la costumbre"* may seem timeless, the pandemic reproduced a sense of vulnerability as they have been neglected by municipal and state help.

Underlying the critical intersections of bodies, environments, and toxicity is the concept of structural violence whereby institutions and structures of power expose people who are already helpless and most susceptible to poverty and violence to further death and destruction (Galtun 1969; Farmer 1996). In consideration of the material realities of poverty and deepening dispossession, this study offers ways to understand how Wixaritari are structurally competent in addressing the threats to their way of life. This study engages with critical medical anthropology by historically situating ethnomedical and biomedical constructs in indigenous contexts. I illustrate how Wixaritari experience of suffering as a social product that manifests in the body and landscapes they organize collectively to protect. I also show how the daily life of Wixaritari in Nueva Colonia, Santa Catarina, exposes them to agrochemical toxins at home and when they migrate for work in the agricultural fields. In utilizing this critical medical anthropological approach, I seek to understand the functioning of medical systems as cultural phenomena and to examine underlying processes in which those illness experiences are embedded (Singer and Baer 2018). This study is also an anthropology of medicine that engages local medical systems and beliefs as an object of study and contextualizes the social-political environmental and biological factors that influence health and illness both in the individual and the community.

My research and lessons from Wixaritari take on the body as a vehicle for thinking, feeling, and acting that cannot be contained by simply a theory of representation nor as body image but of the material reality of substance and action both on the level of researcher and interlocutors (Kirmayer 1992). This study builds upon the work of Arthur Kleinman and Joan Kleinman to engage the body and society as the space between subjectivity and symbolic order, agency, social control, and illness experience (Kleinman and Kleinman 1994). Bodies and landscapes get transformed, and in the post-genomic era, the nature-versus-nurture debate is not dichotomous (Lock 2015). This study moves beyond a reductionist view of biology and considers factors influencing health outcomes heavily influenced by social processes and environmental factors.

Within a critical medical anthropology, toxicity generally sees the body as reactive with the environment. Two things emerge from this view: one is that the body cannot be assumed to be standardized or universal, and, two, any body is entangled in social and political processes such that on a molecular level it is an "embedded body" (Lock 2005:160). The body cannot be separated from the very parameters of what is considered environment: the material toxins and the social and psychological processes in which bodies are embedded (Lock 2005). Therefore, medical anthropology attends to the social and material environment and the interpretation of these environments by its inhabitants (Lock 2005). Food as a molecularized epigenetic trigger is the subject of the subfield of nutritional epigenetics.

Food and agrochemicals overlap in three major categories of chemicals. The first is threshold chemicals, where industry determines the safety threshold and acceptable daily dose or ADI. The second is carcinogenic or non-threshold chemicals, such as herbicide. The third is endocrine-disrupting chemicals (Colborn, Dumanoski, and Myers 1996). If we cast processed foods as molecularized epigenetic triggers, the implication of their pervasiveness, I argue, must be seen as a type of proxy chemical warfare. Considering decades of development policies like the Green Revolution, Plan HUICOT, and NAFTA have reduced local people's access to centuries-old food systems and replaced them with products containing high fructose corn syrup, high sodium, and products laden with chemicals during production. The food experience has been reduced to a series of individual consumer choices instead of collective procurement, preparation, and consumption.

The Consejo Regional Wixarika (CRW) has been at the forefront of the battles to protect sacred sites. A founding member and trained lawyer, Santos de la Cruz, spoke with me after a press event about the need to re-direct their attention to the mining concession in *Wirikuta.* The many land disputes that are decades old are important, but after ten years, the mining company has not let up and the imminent environmental threat is looming. In 2010, First Majestic Silver Corporation renewed a mining concession for an open-pit gold and silver mining project that crosses Wixaritari ritual pilgrimage routes to landscape sites. Wixaritari leaders, civil society, and a dozen organizations banded together to figure out a way to stop it. They organized marches in major cities, and popular music groups chorused the

movement's slogan, "*Wirikuta no se vende, se proteje y se defiende*!" (Wirikuta is not for sale, we protect it and defend it). It worked: in 2012, a judge in the state of San Luis Potosi ordered a moratorium before the mining activities in *Wirikuta* could begin.

However, according to Santos, the mining company has grown impatient and continues to intimidate. In accordance with the moratorium ruling, the Council of Elders had set up a group of about ten Wixaritari who rotate a cargo duty to provide surveillance in *Wirikuta*. According to Santos, ten years after the moratorium, the Wixaritari vigilance group is still reporting intimidation from the mining group: temples destroyed, sniper shooting at Wixaritari performing pilgrimages, and buying off locals and politicians to vocalize support of the mining project. Santos recounted struggles that ended in bittersweet victories like the land dispute in Huajimic, where Wixaritari re-acquired ten thousand acres of ancestral lands but at the cost of the lives of three leaders. He also reflected on the many allies they've made after ten years of protecting landscapes shared by other indigenous groups and mestizos. He stressed that the land disputes were important but that they were distractions from the fight to protect *Wirikuta* because the Canadian company, First Majestic Silver, and its Mexican partner, Real Bonanza, have been increasing their campaign to lift the moratorium. It is easier to stop a mining project from starting than stopping it after it has begun. If they let up and the project gets underway, at stake is Wixaritari's collective wellbeing because it would destroy an important pilgrimage site that is the home of their culture hero, *Tamatz Kayumari* and the place where the sun was born

into existence. The collective trauma from the loss would be unspeakable to the Wixaritari people. The subsequent toxic waste would devastate the region and deplete the water supply for all inhabitants. However, if they manage to stop the mining project, it would culminate in a successful episode in Mexico's modern environmental movement.

Wixaritari connect to a vast network of temple landscapes and engage with their deities via a civic-religious cargo system of hierarchy. Wixaritari senses of body and landscape- human connection is the basis for how they conceive of sickness and healing. These relationships between landscapes, bodies, and wellbeing offer significant opportunities to study how an indigenous community has protected a vast network of geographic space from destruction by extractive industries and land dispossession. This project has also enabled me to study the environmental epigenetic implications of exposure to chemicals and processed foods. Exposure is not isolated from social processes. I argue that trade policy and development programs that implement market-based structural adjustments were embodied in ways that became syndemic with Mexico's metabolic epidemic. The restructuring of Mexican society enabled the labor force's hyper-exploitation by transforming workers into independent contractors without health or retirement benefits. Market-based ideology transformed patients into consumers and treated disease etiology as a series of individual choices and personal responsibilities.

Meanwhile, on a national and global level, government-biotech partnerships profit-generating schemes to sequence the population’s genes for “ethnic remedies”

has been described as “biocolonialism” by social scientists, scientists, and medical ethics scholars (Hawthorne 2007; Benjamin 2009; Siqueiros-García, Oliva-Sánchez, and Saruwatari-Zavala 2013). The genomic sovereignty law enables publicly collected data to be privatized and restrict access to elite or government institutions, resulting in asymmetric relations among research groups within the nation (Hawthorne 2007; Benjamin 2009; Siqueiros-García, Oliva-Sánchez, and Saruwatari-Zavala 2013). It also creates a “contradictory tendency—unifying *and* differentiating a diverse body politic, cultivating national scientific *and* commercial autonomy and dependence upon global knowledge networks and foreign capital (Benjamin 2009, emphasis in original). On the surface, genomic sovereignty appears to rebrand the nation-state with genetic nomenclature, “but racialized populations are excluded from rights to produce authoritative knowledge of diseases affecting their communities and restricting their rights of reception to passively internalizing the products of social marketing for health (Briggs 2005:279). Trade policy created a toxic food environment by replacing ancient food systems with global market products high in sodium and fructose corn syrup. The restructuring also privatized the subsoil for extractive industries that increased the risk of bodily and environmental toxicity. How does studying this syndemic just before the pandemic illuminate systemic violence both at the larger scales of land grabs and abject poverty to microlevels of toxicity, exposure, and illness within people’s bodies? In the context of indigenous rights to land and their way of life, studying syndemics helps examine how structural inequities influence disease etiology. The COVID19 pandemic illuminated the

dangers of market-based approaches to emerging epidemics and how the most vulnerable in society suffer an unequal burden of the risk to health and safety. Wixaritari are experiencing genocide by systemic neglect during the COVID19 pandemic as state agents have not offered sufficient supplies and medical information. In sum, Wixaritari continue to solve their health issues and land disputes on their own with the allies they have made. As long as Wixaritari keep fighting to maintain their longstanding landscape practices, their resistance movements will grow and persistently innovate strategies to respond to renewed threats of land grabs or toxic environments.

Appendices

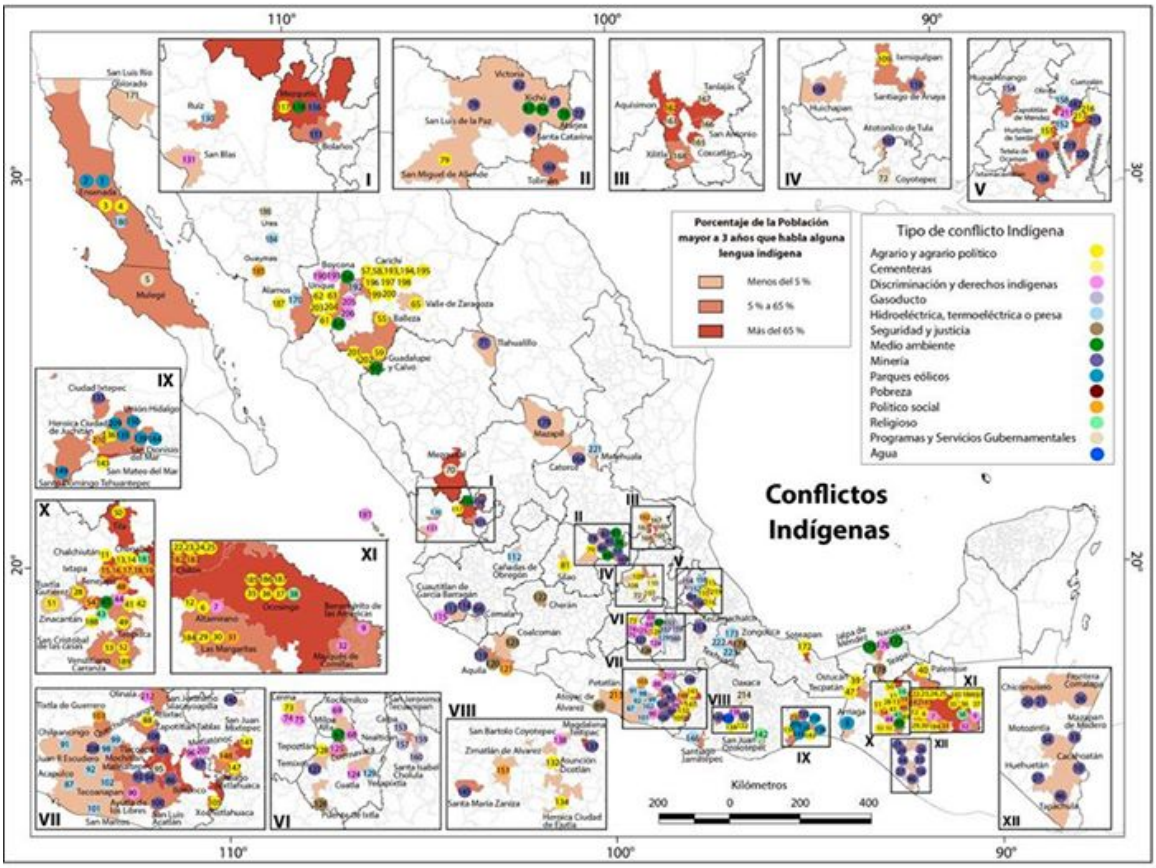
Maps

1. Mining

Mining companies and minerals extracted: Oro (Gold), Cobre (Copper), Plata (Silver), Plomo (Lead), Zinc, Manganeso (Manganese) and Molibdeno (Molybdenum). According to the Secretary of Economy, Mexico is second in the

world production of silver, bismuth, and fluorite; fifth in the production of lead; sixth in zinc, molybdenum, cadmium, graphite, and gypsum; eight in production of gold and manganese. There are 902 mining projects funded by foreign capital. 97 are in production phase, 42 in development; 632 in exploration phase; 129 in postponement and 2 in promotion phase. The majority of foreign capital is from Canada who is involved in more than 70% of the mining projects. Of the 293 registered companies, 205 are Canadian, 46 are from USA, 10 are from China, 6 from Australia, 6 from Japan, 5 from United Emerits, 4 from Korea, 2 from Chile, 2 from India and 1 from each of the following countries: Spain, Italy, Belgium, Luxemburg, Brasil, Argentina and Peru. Source: Secretaria de Economia, Mineria, Servicio Geologico Mexicano, Diciembre 2018.

2. Indigenous Conflicts



Indigenous conflicts as listed by the color list inside the box “Tipo de conflicto Indigena”: Agrarian, Cement industry, Discrimination and Indigenous rights, Natural gas, Hydroelectric or thermoelectric dam, Security and justice, Environmental, Mining, Ecological parks, Poverty, Social political, Religious, Programs and Government services, Water. The highest incidences of conflict in indigenous territories are mining and agrarian issues. The Comission on the Dialogue with Indigenous Communities publishes this map. The Commission acts as an ombudsman with land restitutions and decrees. They estimate 335 unresolved disputes across 29 of the 32 Mexican states. The estimate is based solely on conflicts which the

commission is summoned usually by local parties to act as arbitration. Source: Comisión para el Diálogo con los Pueblos Indígenas (CDPI) in https://www.excelsior.com.mx/nacional/2018/01/07/1212041

3. Photographs

All photographs by author (2015)

The construction of the adobe room in which I lived in while in the field. After we completed the adobe structure, I walked around the inside and outside and encountered six scorpions. After that, I set up a sealed tent inside the adobe room and slept inside the sealed tent.

The walls are complete in this picture. The next step was the roof.

We decided to make the roof from adobe bricks and fill it with dirt. Tin makes too much noise while it rains. The first step was to cut thick support beams and the boards that are placed on top of the beams as shown in the image. After the boards. a thick plastic liner as a moisture barrier. Next, two layers of adobe bricks around the perimeter of the roof. Finally, the roof is filled with sifted dirt (next picture).

The first layer after the liner must be sifted dirt. Dirt is sifted to prevent rocks from puncturing the plastic. The final layer is a white clay dirt that dries like natural concrete.

The fresh spring at La Curva. Water comes out of the three PVC pipes inserted into the mountain that tap into the source. One of the Sierra's many fresh springs but this one is known to be the finest tasting water in the Sierra. This was my source of water for bathing, drinking, and the adobe construction. About 12 families live in the immediate area near the fresh spring.

Nueva Colonia, Santa Catarina

Taimarita village is embedded in the trees in the middle part of the picture.

Las Latas temple village

Glossary

List of Acronyms and Organizations

CAFTA – Central American Free Trade Agreement, 2006

CDI – Comisión on Indigenous Development

CDPI – Comisión para el Diálogo con los Pueblos Indígenas

CIESAS – Centro de Investigaciones y Estudios Superiores en Antropologia Social

CONACYT – Consejo Nacional de Ciencias y Tecnología

COSOMER – Programa de Atención a Conflictos Sociales en el Medio Rural

CRW– Consejo Regional Wirarika por la Defensa de Wirikuta, Consejo Regional Wixarika

EDCs—endocrine disrupting chemicals

Fiscales – Customs officials placed along the toll booths in major highways

Human Genome Project (HGP)

IMSS – Instituto Mexicano de Seguro Social

INAH – Instituto Nacional de Antropologia e Historia

INI – Instituto Nacional Indigenista

INSABI – Instituto de Salud Para el Bienestar Popular

CIMMYT – International Maize and Wheat Improvement Center of the Rockefeller Foundation

ITESO – Instituto Tecnologico de Estudios Superiores de Occidente

La Voz de Los Cuatro Pueblos – The Voice of the Four Publos, radio station in the Sierra.

NAFTA – North American Free Trade Agreement, 1994

Naiti Tetewa Uatiarietse – community hospital in Huejuquilla El Alto

Oportunidades

Plan HUICOT – Development program, 1971-1974, Huichol, Cora, Tepehuano

PRI – Partido Revolucionario Institucional

PRONASOL – Programa Nacional de Solidaridad, National Program of Solidarity

Piso Firme

Secretaria de Desarrollo Rurual (SEDER)

Secretaria de la Reforma Agraria (Tribunales Agrarios) – Agrarian Tribunals of the state of Jalisco

Secretaria de salud – Secretary of Health of the state of Jalisco

SEDATU – Secretaría de Desarrollo Agrario, Territorio y Urbano, Secretary of Agrarian, Territory and Urban Development

SEMANART– Secretaría de Medio Ambiente y Recursos Naturales

UDG – Universidad de Guadalajara

Glossary of Spanish and Wixaritari Terms

Spanish terms

Aguantar – to withstand something painful or difficult to bear

Arde – pain from fire

Grupo de Autodefensa – armed, auto-defense group

Barbecho – is to allow the land to fallow and is possible when there are sufficient lands because fields are given anywhere from 3-8 years of rest

Barranca – A steep bank in the mountain

Bienes comunales – common property

Bilis – bile

Bloqueos – fire blockades

Cabecera – referring to Wixaritari communities

Carajo – damn!

Coamil – Nahuatl term, noun: Corn field verb: the act of working the corn field

Comadre, compadre – female, male extended kin through ritual

Deshierbes – (de-weeding) manually or with chemicals

Empacho – indigestion

Enfrentamientos – confrontations

Espinosilla – *Loeselia mexicana*, Mexican false calico

Estafiate – *Artemisia ludoviciana*, mugwort

Filtros sanitarios – sanitation filters, checkpoints

Grupo autodefensa – autodefense group

Herbolaria – herbal knowledge.

Heridos – injured

Jitomate – tomato

La Voz de Los Cuatro Pueblos – The voice of the four pueblos

Mal de aire – the idea that airs penetrate the body

Mal ojo – the idea that someone casts a spell or evil eye

Manzanilla – *Perityle microglossa*, Shortray rockdaisy

Maruchan – Company that makes Cup'O'Noodles brand instant ramen

Mestizo – A Spanish social category referring to a mixed person of Indigenous and Spanish descent

Muerto – dead

Municipios – municipalities

Narco – drug lord

Nervios – nerves

Prendido – turned on, motivated

presidencia – town hall

quelites – *Amaranthus hybridus,* pigweed, amaranth pigweed

quema – burn

Rampas – cement ramps used to ship vehicles in trailers.

Rampas – cement ramp to drive a vehicle into a trailer

Roza or tumba – slash vegetation as in slash and burn

Se va querer llevar – an idiom to denote someone is playing around

Sicarios – hitmen

Susto – a belief that a traumatic freight causes sickness

Wirikuta no se vende, se proteje y se defiende – Wirikuta is not for sale, we protect it and defend it

Wixarika terms

Coamil - a Nahuatl term meaning "huerta con arboleda" or plot of vegetables

Hikuri – peyote

Huatzia – The Wixaritari term for coamil

Huaxa Manaká – "Place of the floating Mother" sacred site to the south on the island in the Laguna de Chapala, Jalisco.

Mara'akame – healer, singer, shaman

Tamatz Kayumari – "Our elder brother deer of the sun," main deity that *mara'akame* consider a culture hero that taught the ancestors and brought the peyote to the earth with each footstep.

Tatéi Haramara – Our Ocean Mother responsible for the rains and water, sacred site located in the Pacific Ocean off the coast of Nayarit.

Tee' kata – a cave near Santa Catarina that is the center of the Wixarika world and place of the original fire.

Tewari – "neighbor", non Wixarika person usually referring to mestizo.

Teiyari – native corn from the Mesa del Nayar or the Wixaritari lands.

Topil – a cargo position for young men to start off in the hierarchy. The topiles are people who enforce code of conduct, dry law (no alcohol) during rituals, and are given a wooden dowell with string to tie up a person.

Tukipa – community temple

tzeuri – hybrid corn introduced by the Tepehuanos

Wirikuta – sacred site to the west in the desert of San Luis Potosi.

Wixarika, wixaritari – single, plural for Huichol

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