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The Bottled Water Industry in Mexico

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The Bottled Water Industry in Mexico

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Dedication

To Ivan, Anthony, Jesse, Aunt Judy,

Grandmas Juliet and Lee and Grandpas Sam and Hugh,

(and Fuco)

we carry your hearts in ours

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This work was undertaken with the support of a fantastic wife, Ana, daughter Juliana. This would not have been possible without the support of my parents who helped in every way. I wish to extend a special thanks to Dr. David Eaton for guidance and inspiration. Thank you as well to the CONAGUA officials from Mexico City who provided time and suggestions and honest evaluations of their nation's water infrastructure. Historian Ana Maria Castellanos from Guadalajara, and anthropologists Gabriel Torres and Magdalena Villarreal were instrumental in providing a background as well as guidance and suggestions. Alice Rentz was supportive, positive and continuously reassuring. Dr. Norman Long and Dr. Bryan Roberts have been great mentors sustaining me through this process.

Abstract

The Bottled Water Industry in Mexico

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The bottled water industry in Mexico represents a new method of providing drinking water to a society without ties to a conventional central piped domestic water supply system. Mexico, the world's leader in bottled water per capita consumption, has struggled to provide reliable, safe drinking water for its citizens. This study examines the context in which the bottled water industry rose to become the primary source of drinking water for a majority of Mexicans. The study shows how the combination of factors allowed the industry's rapid rise from a niche market of elite and 'healing' waters to its present size. The cholera epidemic of the 1990s, the 1985 earthquake, and the financial crisis that left Mexico unable to invest in water infrastructure forced consumers to seek alternative water sources. Political factors and the liberalizing reforms of the 1980s, 1990s and 2000s facilitated market solutions and private-public-partnerships to meet the needs of the Mexican citizens. The world's largest food and beverage distributors bought into the market and found that the public was willing to pay cash for water bottles where the public water sector had failed to deliver potable water. Despite the fact that bottled

water is more expensive per unit of water than a centralized delivery system, consumers are willing to pay a high price for clean water. It is an open question whether consumers return to tap water even after improvements have been made, once the bottled water industry has been so established.

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INTRODUCTION

"Mexico has become one of the most valuable water markets for beverage bottling companies in the world." [1]

Mexico is the world's number one per capita nation in bottled water consumption.[2] Bottled water is also the number one source of drinking water for Mexicans, with more than 81 percent of Mexicans reporting that for drinking purposes they avoid tap water (see Appendix 1).[3] This report seeks to explain the evolution of the bottled water industry in Mexico, driven by a general insecurity in the public water system.[4] While the bottled water industry is now expanding into emerging markets in Southeast Asia, Mexico is the first country to lead the world in this new model of the provision of potable water. The bottled water industry differs from a utility because it delivers drinking water with limited investment. Whereas privately or publicly owned water utilities require capital-intense investments in pipes, pumps, and user connections, the bottled water delivery system requires a treatment facility and trucks. In the last twenty years the bottled water industry has seized this opportunity and grown from a

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1 Southeastern Bottled Water Association, "Bottled Water Battles," *Southeastern Bottled Water Association: Industry News,* SEBWA, April 13, 2012, accessed at Jan. 14, 2014, *http://sebwa.org/bottled-water-battles/*

2 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

3 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

4 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.

niche market valued in the low billions to a $135 billion industry and it continues to expand.[5] In Mexico, officially the world's largest per capita bottled water market, government authorities estimate that less than half of the bottled water market is accounted for, with half attributed to informal sales.[6] A recent study by the Inter-American Development Bank (IDB) reveals the industry is much larger than previously estimated (see Appendix 1).[7]

This report describes the rise of the private bottled water industry in Mexico. It has evolved in a context of public infrastructure degradation, financial instability, political reform, and an outbreak of cholera. In addition major multinational firms have chosen to invest under these political, economic and social factors. This study also addresses the strategies of the leading industrial actors as they built an industry that can now compete throughout Mexico for water distribution.

This study began with archival and bibliographic research in Spring 2013 as part of a The University of Texas Lyndon Baines Johnson School of Public Affairs seminar taught by Eugene Gholz, Ph.D. on "Policy Making in a Global Age." Additional research was conducted during a Summer 2013 conference course supervised and directed by David Eaton, Ph.D. Field visits to carry out interviews and visit bottled water facilities were carried out in August, October, and December of 2013, in

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5 Farooq, Humaira, "Building an 'electronic' ecosystem for water manufacturing industry," *Waypoint Systems, Tech & Science,* Dec. 9, 2013; and Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," report at website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012, accessed on Jan. 3, 2014 at http://www.bottledwater.org/economics/industry-statistics

6 Barrientos, Alberto, "Buscan Agua Purificado," *Reforma*, March 22, 2007.

7 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

Guadalajara, Mexico; Las Juntas, Mexico; Matamoros, Mexico; and Ciudad Juarez, Mexico. Additional interviews were carried out in July 2013 in Austin, Texas, with senior Mexican officials who work at Mexico's national water commission, CONAGUA, when these officials came to Austin to attend a bi-national water quality modeling training event.

CHAPTER 1: THE BOTTLED WATER INDUSTRY OVERVIEW

Some analysts report that 700 million to 1.7 billion people (10 to 20 percent) worldwide lack access to clean water and that such numbers may climb.[8] An additional 20 percent of the world's population live in water stressed regions, defined as places where annual water withdrawals exceed 40 percent of the total available resources.[9] Banks and global governance organizations and research institutions all predict shortages of water supplies for agricultural, industrial, and human needs. A range of international institutions from organizations such as Food and Water Watch, the World Bank, the United Nations (UN), and the World Health Organization (WHO) have proclaimed potable water shortage a major issue facing humanity in the coming decades, as illustrated by former UN Secretary General Kofi Annan's 2001 warning that water scarcity may become a source of conflict and war.[10] It is useful in this context to understand the current landscape of water provision.

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[8] Jaffee, Daniel and Soren Newman, "A Bottled Half Empty: Bottled Water, Commodification, and Contestation," *Organization & Environment,* 2012, v26, n3: p391..The United Nations, *The World Bank Millennium Goals Report, 2013*, Inter-Agency and Expert Group on MDG indicators, New York, 2013. Food and Water Watch, *World Water,* Food and Water Watch website, 2013; WHO, "Opening remarks at Budapest Water Summit," opening remarks by WHO Director General Margaret Chan published on-line *Dr. Margaret Chan's main address at the water summit,* WHO, 2013, accessed at http://www.who.int/dg/speeches/2013/water_sanitation_opening/en/ and OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009.

[9] OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009. The UN adopted this Relative Water Stress Index in its 2006 United Nations *World Water Development Report*. Water scarcity is reached when the ratio of water use to the renewable water supply is greater than 75%.

[10] Spoth, Tom, "Peace over water?" *SAIS Review of International Affairs,* Winter-Spring 2009, v29, n1: p113.

Provision of water to a citizenry has been one role of central governments, as in the Han Empire in China, the Roman Empire, the Indus civilizations, the Assyrians in ancient Turkey and the Aztec's aqueducts in the Americas.[11] Managing water resources has been both "the most necessary resource of survival" and "one of the most formidable natural obstacles and limitations to growth."[12] Control of water can mean bountiful food supplies, internal security, reliable power, trade, and improved human health. The basic provision of safe water has paralleled the global decline in child mortality due to dysentery and water related diseases.[13] Scientific advancements have resulted in advanced water treatment systems, the licensing and professionalization of water utility workers, and the widespread implementation of plumbing and water distribution systems. These services are fundamental to today's urban environments.

Until the emergence of the bottled water industry the civic responsibility for the general provision of drinking water has fallen into a range of categories: entirely public water utilities; publicly owned and privately managed utilities; or privately owned and operated utilities.[14] While the benefits and challenges of public or private management of municipal water works are well studied, less attention has been paid to the "rapid

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11 Solomon, Steven. *Water: The Epic Struggle for Wealth, Power, and Civilization*. New York: Harper, 2010: p48.

12 Solomon, Steven. *Water: The Epic Struggle for Wealth, Power, and Civilization*. New York: Harper, 2010: p18.

13 Singh, Gopal, *Title V 75 Anniversary Celebration. Child Mortality in the United States 1935-2007: Large racial and socioeconomic disparities have persisted over time,* report for US Department of Health and Human Services, Health Resources and Services Administration, 2010. In the United States child mortality fell by more than 98 percent from 1907 to 2007 from 1,418.8 deaths per 100,000 to 28.6. Certainly other factors such as refrigeration, transportation, communication and the dissemination of germ theory played a role as well.

14 Jaffee, Daniel and Soren Newman, "A Bottled Half Empty: Bottled Water, Commodification, and Contestation," *Organization & Environment,* 2012, v26, n3: p391.

growth of bottled water and its transformation into a global industry."[15] The bulk of the literature that does exist examines the large stream of waste that the industry produces and decries the ecological impact as "embedded" water is in the production of the plastic bottle may exceed the water volume in a bottle.[16] There have been few studies on the significance of a nation's water being provided through bottled water to a majority of its citizens even though this is occurring. For example, in 2010, 66 percent of Mexicans reported they only drink bottled water.[17] In some regions of Mexico, bottled water use is close to 100 percent while in others, like Monterrey, it is closer to 30 percent [see Appendix 1]. Neither the survey results nor the Inter-American Development Bank (IDB) conference, "How Mexico Became the Number One Consumer of Bottled Water" where the survey was discussed, has been mentioned in a single academic article. There has been little public awareness and even less discussion and analysis of the policy implications of bottled water's shift from "a niche product to a nearly ubiquitous consumer object in both the global North and the South."[18]

Bottled water is the commodification of water.[19] Bottled water "renders water far more mobile and profitable than municipal water systems can."[20] Since the 1990s bottled

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15 Guillen, Guillermina, "El agua inicia proceso silencioso de privatizacion en Mexico," *Noticias Financieras,* Nov. 8, 2005.

16 Gleick, Peter, *Bottled and Sold,* Island Press, 2010. p271, 2010.

17 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

18 Jaffee, Daniel and Soren Newman, "A Bottled Half Empty: Bottled Water, Commodification, and Contestation," *Organization & Environment,* 2012, v26, n3: p391.

19 Jaffee, Daniel and Soren Newman, "A More Perfect Commodity: Bottled Water, Global Accumulation, and Local Contestation," *Rural Sociology,* March 2013, v78, i1: p2.

20 Jaffee, Daniel and Soren Newman, "A More Perfect Commodity: Bottled Water, Global Accumulation, and Local Contestation," *Rural Sociology,* March 2013, v78, i1: p2.

water has grown from a small unnoticed market to its present size estimated at $135 billion.[21] The emergence of the bottled water industry has presented an entirely new model of providing potable water to a population.[22] This model is successful in part because it allows individual consumers access to clean water despite the questionable quality of water in their centralized water system. Brands compete for profit margins by highlighting the health and cleanliness benefits of their water. Simultaneously they resist regulators' attempts to submit their products to consumer safety testing. Consumers report that they buy bottled water for concerns over health, assuming that corporate water providers would not risk their brand name selling contaminated water. People believe that bottled water is safer than tap water,[23] even when, in some markets bottled water is also contaminated.[24]

The bottled water industry represents a new way forward as widespread water shortages are forecast and water is increasingly viewed as an economic good.[25] Unlike

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21 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.; Farooq, Humaira, "Building an 'electronic' ecosystem for water manufacturing industry," *Waypoint Systems, Tech & Science,* Dec. 9, 2013.

22 Jaffee, Daniel and Soren Newman, "A More Perfect Commodity: Bottled Water, Global Accumulation, and Local Contestation," *Rural Sociology,* March 2013, v78, i1: p2.

23 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

24 Gutierrez, Rey, Vega, Salvador, Ortiz, Rutilloa and Beatriz Schettino, "Presence of organochlorine contaminants in bottled drinking water from Mexico City," *Water Science and Technology: Water Supply,* 2012, v12, n4; Fox News, "More than 24,500 chemicals found in bottled water," Fox News, Jan. 13, 2014; Sukhija, Sheetal, "Beware of contaminated bottled water," IBN News, Mar. 19, 2012, accessed at http://ibnlive.in.com/news/beware-of-contaminated-bottled-water/240233-60-119.html.

25 International Conference on Water and the Environment, "The Dublin Statement on Water and Sustainable Development," International Conference on Water and the Environment, 1992, reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing demand on a vital resource,* The International Debate Education Association, 2007. OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009, Cosgrove, William; Rijsberman, Frank, *World Water Vision Report: Vision Statement and Key Findings,* in Fishbone, Aaron ed. *The Struggle for*

previous models of water provision, with the bottled water model, providers are not burdened by the costs of maintenance, reconstruction, or the expansion of an aging water distribution system. The Organization for Economics Co-operation and Development (OECD) estimates infrastructure and maintenance costs are 85 percent of the total costs in centralized water treatment and distribution utilities.[26] The bottled water industry avoids these capital costs, as water treatment makes approximately 15 percent of the cost of providing water.[27]

Centralized water utilities in the United States can provide one thousand liters of water for approximately $1 to $2 US dollars. The City of Newark, Ohio charges $0.95 per cubic meter while The City of Austin uses a tiered scale, charging $1.84 per m^3 for the first 2 m^3 and $3.39 per m^3 for each subsequent cubic meter. A similar quantity of bottled water would cost a consumer between several hundred to several thousand times as much [see Appendix 4].[28]

Throughout the world, private and public water utilities have struggled to make the necessary investments in water infrastructure in times of increased water use and decreased public spending.[29] Increased contamination of drinking water sources has further increased the costs and risks associated with public drinking water provision. In comparison, the bottled water industry is light and nimble. Water is treated, bottled and

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Water: Increasing Demands on a Vital Resource, International Debate Education Association, NY, 2007.

26 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p27.

27 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p27.

28 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009; IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

29 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009.

shipped out on trucks to stores and homes. Big companies can focus on high concentrations of people with a high willingness to pay, leaving smaller providers to handle less profitable routes. Cash strapped local and regional governments offer corporations with cash in hand concessions to the best water sources.[30] In 2014, the bottled water industry is positioning itself for control of a market where demand will be ever increasing, supplies limited, and prices and profits responding in accord.

The bottled water market is one of the fastest growing market sectors on the planet.[31] For the past two decades the global bottled water market annually posted double-digit rates of growth to become a $135 billion industry in 2011.[32] Some analysts predict sales to reach $176 billion by 2016.[33] Meanwhile, within the industry, the leading companies report double-digit quarterly growth in their water divisions.[34] They are currently vying for dominant positions as they expand into Southeast Asia.[35] The industry is on track to reach an annual volume of 450 billion liters by 2021, up from 275 billion in 2012.[36]

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30 Royte, Elizabeth, *Bottlemania: How water went on sale and why we bought it,"* Bloomsbury, New York, 2008. Barlow, Maude and Tony Clark, *Blue Gold: The fight to stop the corporate theft of the World's Waters,* New York Press, New York, 2002, p53; Gleick, Peter, *Bottled and Sold,* Island Press, 2010: p271; Snitow, Alan, *Thirst: fight the corporate theft of our water,* Jossey-Bass, San Francisco, 2007.

31 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p33.

32 Farooq, Humaira, "Building an 'electronic' ecosystem for water manufacturing industry," *Waypoint Systems, Tech & Science,* Dec. 9, 2013, cites Marketline Research's *2013 Bottled Water Industry* report.

33 Farooq, Humaira, "Building an 'electronic' ecosystem for water manufacturing industry," *Waypoint Systems, Tech & Science,* Dec. 9, 2013.

34 Business Monitor International, "Industry Trend Analysis: Bottled Water Sales Continue to Grow," Oct. 18, 2013.

35 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012. Nestle Annual Report 2013.

36 Hall, Richard, *The 2012 Global Bottled Water Congress,* Zenith International, 2012.

The bottled water market began as a niche market of spring waters sold to consumers who appreciated the mineral content. In the latter half of the twentieth century two of the world's largest food processors and distributors, Nestlé and Danone, bought up the world's most elite bottled water brands. Then, at the turn of the century, traditional beverage manufactures such as The Coca-Cola Company, PepsiCo, and the Dr. Pepper Snapple Group, entered the market and invested to secure rights to water concessions to guarantee long term growth. Danone, Coke, and Pepsi, along with Nestlé and are the industry's market leaders, together sharing a third of the global market and over 80 percent of the Mexican market.[37]

While the United States, Latin America and Europe have made up the industry's largest consumers, the contested markets are now the new emerging economies. China and India hold the highest potential.[38] Southeast Asia, with high regional consumption levels and large populations, has the most potential to grow.[39] Some developing countries experiencing increased urbanization and highly centralized governments have been unable to maintain and expand public water systems to meet the needs of their citizens. A centralized water system offers cost efficiencies through economies of scale but tends "to institutionalize dependence on national water agencies because it does not develop strong indigenous organizations that can operate, maintain, repair, and extend

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37 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012. Nestle Annual Report 2013; Hall, Richard, *The 2012 Global Bottled Water Congress,* Zenith International, 2012.

38 Gleick, Peter, *The World's Water Volume: the biennial report on freshwater resources Vol. 7,* Island Press 2012.

39 Hall, Richard, *The 2012 Global Bottled Water Congress,* Zenith International, 2012.

the system after it's built."[40] China's bottled water market, arguably the world's second biggest market (in total sales) grew at 11.9 percent per year from 2005 to 2010.[41] Some sources proclaim China as the current market leader while others proclaim Mexico as the winner.[42] In 2011 China had a 95 liter per person rate of bottled water consumption, less than one quarter of Mexico's, yet they have 11 times Mexico's population.[43] With 60 percent of China's cities facing seasonal water shortages, 100 cities experiencing severe water constraints, and increasing concerns with groundwater contamination, in China "bottled water, therefore acts as a necessity."[44] With almost unlimited potential to expand, the Chinese market represents the bottled water frontier.

Forecasts for dire water shortages continue to drive this discourse. While the severity of the predictions vary, organizations agree that water shortages will become common throughout the world over the next two decades. The Bank of America's *Water Sector Report* predicts that global water demand will "overshoot supply by 40 percent by 2030."[45] The OECD reports that 47 percent of populations in OECD countries will

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40 Eaton, David, "Extending Rural Water Supplies in Developing Countries," *Journal of American Water Works Association,* June 1985: p11.

41 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

42 Hall, Richard, *The 2012 Global Bottled Water Congress,* Zenith International, 2012. IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

43 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011, and Business Monitor International, "Industry Trend Analysis: Bottled Water Sales Continue to Grow," Oct. 18, 2013.

44 Business Monitor International, "Industry Trend Analysis: Bottled Water Sales Continue to Grow," Oct. 18, 2013.

45 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p33.

lack access to safe water by 2030, and these estimates do not take into account climate change impacts.[46]

Both supplies of potable water and competition for water among user support effect this spurt in the bottled water industry. As developing countries grow economically their industrial demand for water will grow.[47] The Bank of America analysts state that industrial water demand represents 22 percent of global demand but in developed markets that rises to as high as 59 percent. As emerging markets move from primarily agricultural to industrial, the change is expected to impact water allocation.[48] "Emerging markets divert water from agriculture to industry as they ramp up their economic growth efforts via large-scale industrialization. Worringly, this is often being done with scant regard for the environmental or social impact."[49]

As the world's population continues to increase and as consumers demand more protein, more water will be required to grow the crops necessary to feed them.[50] Projections suggest the global population will grow 50 percent by 2050 "while the world's water resources will remain constant."[51] Water allocated for agriculture represents 70 percent of the global total but varies significantly by country. While global analysts suggest that global agricultural water demand will increase by 50 percent by 2030, this could be even more dramatic in agricultural economies such as Mexico. In

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46 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009.
47 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p33.
48 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p33.
49 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p19.
50 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p20.
51 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p20.

Mexico, 84 percent of the water consumed is used in agricultural production, 12 percent is used by the municipal sector, and 4 percent is used by the industrial sector.[52] Finally, "water scarcity is also emerging as a direct consequence of water quality issues."[53]

Advocates for a market solution to the unfolding water crisis suggest a fourth cause of water scarcity: non-revenue water (NRW) or water that is consumed without generating revenue. The market solution argument states that only by adequately pricing water can its use reflect its value and its waste minimized.[54] NRW, attributed to older water systems with broken, leaking pipes and fittings, exceeds 50 percent of the current quantities of extracted water in some regions of the world.[55] "Two-thirds of the volume of water is lost in low- and middle-income countries."[56] Mexico's two largest cities lose 40 percent of their water due to leakage.[57] The market solution for water scarcity suggests that as water becomes more valuable the cost-benefit analysis will eventually favor fixing these leaky systems.

In Mexico, for decades the government has subsidized the cost of potable water infrastructure. In a time of limited financial resources there is little public will to undertake the massive public investments needed to repair centralized water systems. In 2000 in Mexico City, for instance, the water rate charged to consumers was $0.175 per

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52 Ortiz, Gustavo, *Administracion del agua: Aplicacion de instrument de politica hidraulica en escenarios alternativos,* IMTA, 2001: p22.

53 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p15.

54 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p16.

55 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p16. IDB, *Study of Non-Revenue Water*, 2013.

56 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28: p16.

57 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011: p16; Josephs, Jeremy, "Megacity Mexico: A Tale of Leaks and Shortages," *Water World,* August 13, 2013.

m^3, while the cost of providing the water was $0.60 per m^3.[58] This difference is in part due to having to produce 40 percent more water than needed because of leaks. According to recent reports Mexico is losing 11 m^3 to 12 m^3 per second.[59]

While the current manifestation of the bottled water industry is new, selling water is as ancient as civilization. Historically there have always been opportunities for businessmen to sell water to outlying homesteads during times of drought or to small towns when water sources became contaminated. In Mexico, *Agueros,* men who drove wagons loaded with barrels of water, linked distant water holes and springs to ranches and small towns. Famous for their regularity these men earned tips and lived in poverty.[60] Even into the twentieth century in some United States markets water was provided through similar vendors.[61] While the sale of water for individual consumption is not new, today's bottled water industry did not develop from these previous distribution channels. Today's bottled water industry is well organized, highly capitalized, and profit centered.[62] Forbes states that Coca-Cola currently earns 15 percent profit from their bottled water sector while higher priced Danone earns 18 percent.[63]

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58 Ortiz, Gustavo, *Administracion del agua: Aplicacion de instrument de politica hidraulica en escenarios alternativos,* IMTA, 2001: p22.

59 Josephs, Jeremy, "Megacity Mexico: A Tale of Leaks and Shortages," *Water World,* August 13, 2013

60 Interview, August 12, 2013.

61 Howe, Barbara, "No More Wiggle-Tail Water," *American Association for State and Local History,* Autumn 2012, v67, n4.

62 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.

63 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.

While bottled water may be cheaper to provide than centralized water transmission and distribution systems, it is much more expensive to the consumer. In general bottled water is priced between several hundred to hundreds of thousands times as expensive per liter as tap water (see Appendix 4).[64] Compared to municipal tap water systems the bottled water industry is a sleek and profitable industry. Unlike tap water distribution systems, bottled water sales can be carried out without the upfront investment of the billions of dollars necessary to provide a city with safe water through pipes, pressure and plumbing. As those who can afford to buy bottled water do so, there is less support for paying more money for tap water – despite a lack of resources for municipal water systems and investment requirements.

The debate around public/ private provision of water is comparable to the transportation debate of personal autos versus public transportation. The personal car has shifted consumer expectations. As more people drive personal cars there has been less widespread support for both private and public transit.[65] In many areas of the United States, by the end of the twentieth century many small towns lacked public transportation altogether.[66]

This analogy suggests that the provision of bottled water as a solution to the water crisis may come at the expense of the reinvestment in the public water

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64 Clark, Tony, "Study of the actual costs of production," *Inside the Bottle,* Canadian Center for Policy, 2007.

65 Kirby, Ronald, "Financing Public Transportation," in *Public Transportation,* Second Edition, George Gray and Lester Hoel Eds. Prentice-Hall, Englewood Cliffs, 1992.

66 Kirby, Ronald, "Financing Public Transportation," in *Public Transportation,* Second Edition, George Gray and Lester Hoel Eds. Prentice-Hall, Englewood Cliffs, 1992.

infrastructure. There are general arguments that this is the case, but as of 2013 there have been no studies testing bottled water's impact on public water infrastructure spending. As companies such as Coca-Cola and Nestlé announce plans to invest billions in bottled water technology, water concessions, and delivery networks, it is important to begin to understand the developments taking place, the specificity of cases, and to begin to outline directions for future research.

In the past decades, research has focused on evaluating the outcome of water management privatization.[67] For a broad spectrum of views, Aaron Fishbone's *The Struggle for Water* (2007) is a good start. The private management of public water works by the French based Suez and Veolia corporations throughout the world along with the differences in outcomes of private management in England, Wales, France and elsewhere have long been studied and evaluated. Whether the private sector is able to out-perform the public sector is still being debated.[68] Yet the third way forward, the bottled water industry, has attracted little academic attention.[69] It has silently enjoyed meteoric sales and profits growing from a niche market of high-end mineral waters to a

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67 Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource*, International Debate Education Association, NY, 2007.

68 Brubaker, Elizabeth, "Privatizing Water Supply and Sewage Treatment: How far should we go?" reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007, Segerfeldt, Fredrik, "Private Water Saves Lives," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007; Hardin, Garrett, "The Tragedy of the Commons," *Science,* Dec. 13, 1968, v162, n3859; and Wieda, William, "A general economic critique of water resources," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007.

69 For a comparison, an internet-based University of Texas libraries search reveals 33 dissertations with water privatization in the title while the same search for bottled water reveals 18. Only 3 of the bottled water dissertations are about the bottled water industry. The others are about bottled water quality, marketing or consumer preference.

model of how drinking water might be provided to the global population in the future. Peasants in Bolivia and elsewhere have taken to the streets to protest against the privatization of their tap water delivery systems, yet even in these hostile environments the bottled water industry thrives.[70]

While the municipal water system seeks to provide safe drinking water at a price that allows for maintenance and expansion, the bottled water industry seeks to provide the smallest serving sized unit container possible. The big four bottled water companies have announced 350 ml or 8 oz bottles for adults and smaller, baby sized bottles for babies. While the municipal water system struggles to convince the public to levy rate increases sufficient enough to sustain the system, the bottled water industry spends billions on advertising to convince customers that the high price provides security and safety and health.

While municipal water systems consume high levels of energy in water treatment and pumping, the bottled water industry consumes much higher levels in the production of the bottle.[71] According to published calculations, the 33 billion liters of bottled water sold in the US in 2007, required 50 millions of barrels of oil to make the bottle.[72] Additional environmental footprints are created through the transportation of bottled water and through the bottle's disposal. Bottled water also uses more water than it

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70 Sjölander, Ann-Christin, *The Water Business: Corporations Versus People,* Zed Books, 2005: p22.

71 Gleick, P.H, Cooley, H.S., "Energy Implications of bottled water," *Environmental Research Leteters,* 2009, v4: p2.

72 Gleick, P.H, Cooley, H.S., "Energy Implications of bottled water," *Environmental Research Leteters,* 2009, v4: p2.; Thompson, Andrea, "The Energy Footprint: Bottled Water," *Live Science,* March 18, 2009. Hall, Richard, *The 2012 Global Bottled Water Congress,* Zenith International, 2012

delivers. Each bottle of water has "embedded water," the water used in the manufacture of the bottle. For example, Gleick estimates that between two and three times the size of the bottle is the "embedded water" in each bottle. In other words, the "embedded" water in a 500 ml plastic bottle is between one and two liters.[73] The bottled water industry argues on its behalf that the majority of the water that it sells in emerging markets is in large refillable 10 and 20 liter bottles. While that may be true, the industry continues to make increasing profits from smaller and smaller non-refillable containers. Thus far the industry has proven remarkably capable of shaping the market in its own favor.

Understanding what is taking place in the bottled water industry is relevant both in the context of developing and developed countries. In developing countries much of the demand for bottled water can be attributed to rapid industrialization, water contamination and the inability of the public system to keep pace. However, the issue of public sector investment in water infrastructure that facilitated the bottled water industry's growth in Mexico, China, India and throughout Africa is present in the United States as well. One reason for the rise of the bottled water industry in the case of Mexico was the inability of its federal government to reinvest in the country's aging and failing water infrastructure. As demonstrated by Detroit in 2013 and numerous cities throughout the US, the ability of the public sector to maintain water infrastructure is questionable in tough economic times. For example, in Washington, D.C. the average water pipe is 77

[73] Gleick, Peter, *The Bottled Water Factsheet,* Pacific Institute, 2007.

years old and "a great many were laid in the nineteenth century."[74] Throughout the United States, from Boston to Cleveland to McAllen, Texas, cities are using water systems designed for conditions, urban life and the water demand, of the early twentieth century that are outdated, failing and in desperate need of reinvestment.[75] The American Society of Civil Engineers warns that by 2040 the United States is on track to face a $143 billion funding shortfall in water infrastructure construction and reinvestment. The situation is the same, and worse, in Mexico. Peter Gleick warns that if the citizens of the United States do not prioritize reinvestment in our nation's infrastructure we too could follow Mexico's path.

> "Those of us who live in the richer nations of the world are buying more and more bottled water because we increasingly fear or dislike our tap water, we distrust government's ability to regulate, monitor and protect public water systems adequately, we can't find public fountains anywhere anymore, we are convinced by advertisers and marketers that bottled water will make us healthier, thinner or stronger, and we're told that it is just another benign consumer 'choice.' If we let our tap water systems decay, however, soon bottled water won't be a choice, it will be a necessity as it already is in countries without safe tap water."[76]

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74 Hasley III, Ashley, "Billions needed to upgrade America's leaky water infrastructure," *Washington Post,* Dec. 22, 2012.

75 American Society of Civil Engineers, *2013 Report Card for America's Infrastructure,* ASCE, 2013.

76 Gleick, Peter, *Bottled and Sold,* Island Press, 2010: p171.

CHAPTER 2: MEXICO AS A CASE STUDY

In many ways Mexico is a perfect case study to understand what is happening in the bottled water industry. While China offers the case of the fastest growing market with the biggest potential, Mexico is the best example of a fully developed bottled water market. While the US market continues to be the biggest as measured by revenue, its growth has stalled since the 2008 financial crisis and the Mexican market is expected to overtake the US in size in 2014.[77] While China's market is bigger in billions of liters sold, Mexico enjoys the highest per capita consumption rate in the world, more than twice that of the US and three times that of China (see Appendix 2) .[78]

There are several key reasons to examine the Mexican bottled water industry. One factor is the market's sheer size. Recent surveys have revealed that the market is many times larger than previously estimated.[79] A second element is that in Mexico bottled water is now the primary source of drinking water for a majority of the nation's population! More than 60 percent of all Mexican's report drinking only bottled water for

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77 Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," report downloadable at website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012, accessed on Jan. 3, 2014 at http://www.bottledwater.org/economics/industry-statistics; Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.

78 Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," from website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012, accessed on Jan. 3, 2014 at http://www.bottledwater.org/economics/industry-statistics; and IDB, Informe Final Encuesta de Consumo de Agua Embotellada BID," final survey results presented at Inter-American Development Bank seminar, *How Mexico Became The World's Top Consumer of Bottled Water*, Nov. 10, 2011.

79 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

drinking water.[80] The third reason for study about the Mexican case is that ample, accessible information exists to document the combination of socio-economic and political factors that allowed the bottled water industry to thrive, which is not true in China. While Mexico may differ from the other nations that lead the world in bottled water consumption, Mexico's industry has faced similar conditions to many developing countries.

As reported at the Inter-American Development Bank (IDB) seminar, "How Mexico Became World's Top Consumer of Bottled Water," as of 2011, Mexico is the number one bottled water market in the world.[81] The United States continues to sell 1.5 billion more gallons per year of bottled water than Mexico. However, Mexico's per capita consumption dwarfs that of the U.S. According to the International Bottled Water Association, in 2011, Mexicans consumed an average of 248 liters per person compared to 110 in The United States.[82] The IDB's 2011 survey, estimates annual Mexican per capita consumption at 480 liters per person.[83] The International Bottled Water Association's survey was an analysis of official sales while the IDB survey was a household survey. Even with the smaller estimate from the International Bottled Water Association, Mexico's per capita consumption has grown at a rate of 7 to 8 percent per

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80 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

81 IDB, "Informe Final Encuesta de Consumo de Agua Embotellada BID," final survey results presented at Inter-American Development Bank seminar, *How Mexico Became The World's Top Consumer of Bottled Water*, Nov. 10, 2011.

82 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012; Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," report at website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012; and Godoy, Emilio, "Dardos contra el agua embotellada," *Inter Press Service,* Sept. 23, 2010.

83 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

year for the entire last decade.[84] The Mexican water market as measured in total dollars is expected to overtake the U.S. in the 2013-2015 timeframe. In 2011, the Mexican bottled water market represented $9 billion in sales while the US market at the same time represented $12 billion.[85] There is also concern that at least 50 percent of the Mexican market is unaccounted for, attributed to small unregulated bottled water companies and vendors.[86] While the Mexican market continues to grow by 8 to 10 percent per year, the US market has become stagnate with 1 to 3 percent growth.[87] If these trends continue the Mexican market will reach $15 billion by 2015 and surpass the US in total sales. This is more significant when both nation's Gross Domestic Production Per Capita (GDPPC) is taken into account. The United States currently enjoys a GDPPC five times larger as that of Mexico.[88] It is true that bottled water sales in China have doubled from 4 billion gallons in 2006 to over 8 billion in 2012, in volume now equal to Mexico's. However, because of China's large population, eleven times Mexico's, their per capita consumption lags behind both Mexico and the US.[89]

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84 Godoy, Emilio, "Dardos contra el agua embotellada," *Inter Press Service,* Sept. 23, 2010.

85 Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," report at website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012.

86 Ramirez, Zacarias, "Empresas buscan fijar una norma para regular venta de agua embotellada," *Noticias Financieras,* Jan. 24, 2012. Gomez, Leslie, "Dificultan 'pirates' revision a hieleros," *Reforma,* June 10, 2007.

87 Rodwan, John, "Bottled Water 2011: The Recovery Continues: U.S. and International Development and Statistics," report at website *International Bottled Water Association Statistics,* International Bottled Water Association, 2012.

88 According to World Bank (2010) data US GDPPC is $48,358 and Mexico's is $8,885.

89 Business Monitor International, "Industry Trend Analysis: Bottled Water Sales Continue to Grow," Oct. 18, 2013.

The Mexican market differs from some other nation's in other aspects. The U.S. bottled water market represents the historical model of bottled water consumption generated through the marketing of status, convenience, health and choice. In contrast, the Mexican market represents a situation where consumers have little choice in whether or not to consume bottled water. Whether bottled water is safer could be debated but the widespread perception is that tap water is dangerous [see Appendix 1].[90]

The Chinese bottled water industry would make a fascinating case study as well due to its rapid rise and incredible potential represented by a population of 1.3 billion.[91] Unfortunately sources of information necessary for a comprehensive study are not readily available to outsiders at this time. According to the International Bottled Water Association (2012), "While Asian nations attained prominence among the world's bottled water markets when measured in total volume, the most populous countries generally do not have high per-person intake levels. … Despite its status as the third-largest market, mainland China had a per capita consumption number well below the global norm even though intake swelled by more than 2.5 gallons per person from 2006 to 2011, nearly doubling."[92] While it is clear that China and the largest countries as measured by population have the potential to become the leading bottled water markets in sales volume and per capita consumption, these are not well developed markets. In

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90 Lara, Juan Antonio, "Encuesta/ Purificada o de la llave, da lo mismo," *El Norte,* Aug. 21, 2008; IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

91 CIA, *World Factbook,* June 2013.

92 Rodwan, John, Jr., "Bottled Water 2011: The Recovery Continues. U.S. and International Development Statistics," *Bottled Water Recovery,* April-May 2012: p21.

contrast, Mexico is a well developed market, with 66 percent of citizens relying on bottled water for personal water consumption.

While many of the details of the rise of the bottled water industry in Mexico differ from other developing country contexts, many of the structural conditions present in Mexico can be seen in developing countries throughout the world. The lack of re-investment in existing drinking water infrastructure and the inability of the government to keep pace with urban expansion and increased drinking water demand are two such factors that were and are present in Mexico and arguably in contexts throughout the world. The struggles of centralized governance systems to provide local services is another shared condition.[93] A political system with little transparency, lots of patronage, and a reliance on foreign capital were factors that facilitated the bottled water industry's growth in Mexico. While Mexico represents a decentralized government on paper, it continues to be centralized.[94] This is exemplified by the 2004 water reforms which put control of the nation's water into the hands of local committees, but the federal rules regarding how these committees would function were never published.[95] While local regional governments and land owning organizations are given power, the allocation of funds and formal permissions continue to be granted from the federal level.

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93 Eaton, David, "Extending Rural Water Supplies in Developing Countries," *Journal of American Water Works Association,* June 1985: p11.

94 Rodriguez, Victoria, *Decentralization in Mexico: From Reforma Municipal to Salidaridad to Nuevo Federalismo,* Westview Press, Boulder Colorado, 1997.

95 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3.

The combination of these factors creates conditions that are often taken advantage of by well organized, highly capitalized foreign interests. The World Bank in 2007 warned that the transition to democratic rule in Mexico was at risk of political capture by special interest groups.[96] Mexico has an economic system characterized by debt and inflation, known for inequality and corruption.[97] Transparency International's 2013 Corruption Perception Index ranks Mexico amongst the world's most corrupt nations, with little oversight and enforcement.[98] Similar conditions to these are found in developing contexts throughout the world, making the case of Mexico representative of how the bottled water industry may expand into new territories.[99]

Furthermore, the rise of the bottled water industry reflects the contamination and overuse of the world's freshwater resources. According to the World Wildlife Fund, throughout the world, freshwater resources as measured in ecosystem health and species population have continued on a downward trend since the 1970s.[100] Mexico is no exception as industrial growth and urban expansion have combined to leave Mexico's rivers amongst the most contaminated in the world.[101] This trend has left many

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96 World Bank, *Democratic governance in Mexico: Beyond state capture and social polarization*," The International Bank for Reconstruction and Development, 2007.

97 Calmon, Paulo Du Pin; Conceicao, Pedro; Galbraith, James; Cantu, Vidal and Abel Hibert, "The Evolution of Industrial Earnings Inequality in Mexico and Brazil," *Review of Development Economic,* UTIP Working Paper No. 5, 1998.

98 Transparency.org: Corruption by country/territory. "Corruption Perception Index 2013," 2013.

99 Transparency.org: Corruption by country/territory. "Corruption Perception Index 2013," 2013.

100 WWF, *Living Planet 2012,* World Wildlife Fund, 2013.

101 Conant, Jeff, "Not a Drop to Drink," *Earth Island Journal,* Sept. 2009. Zerkel, Eric, "World's Most Polluted Rivers," *Weather Underground News,* July 1, 2013. Tucker, Duncan, "Greenpeace activists draw attention to polluted Santiago," *Guadalajara Reporter,* April 5, 2012.

communities without reliable safe sources of water leading in parallel to the growth of the bottled water industry.

In each nation the bottled water industry has developed within specific political, economic and environmental conditions and, "If you go to Mexico or Manilla, you'll see the same thing, but they have emerged independently."[102] The industry has adopted varied tactics in order to ensure growth under these varied national contexts. Different firms are active in different regions, although one constant is the role of major beverage companies shifting into the bottled water market and employing their already well developed distribution networks. For example, in Mexico's The Coca-Cola Company and Coca-Cola Femsa illustrate how major firms secured market shares. Mexicans already led the world in annual per capita consumption of Coca-Cola, as in 2011, Mexicans consumed 728 servings of Coca-Cola products compared to 408 in the United States.[103] The fact that President Vicente Fox (2000-2006) was the CEO of Coca-Cola Mexico prior to becoming the president of Mexico, offers additional insight into the political justification for the public support for the move towards the commodification of water. As a former Coca-Cola executive Fox was a very public proselytizer of the superiority of the private sector in the provision of services.[104] Thus, the sheer size of the bottled water industry in Mexico, the contextual circumstances describing its rise, and its

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102 Malkin, Elisabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *Mexico City Journal,* July 16, 2012.

103 The Coca-Cola Company, *Coca-Cola 2011 Annual Review*, 2012.

104 ANEAS, "Discurso del President Vicente Fox Quesada," *Agua y Saneamiento,* Asociation Nacional de Empresas de Agua y Saneamiento, June 2006: p32.

relevance to the twenty-first century water crisis throughout the world justify this case study.

CHAPTER 3: MEXICAN BOTTLED WATER'S FOUR ORIGIN STORIES: AN EPIDEMIC, AN EARTHQUAKE, A FINANCIAL COLLAPSE AND THE ADVERTISING AGE:

There are at least four origin stories of how the bottled water industry became the primary source of drinking water in Mexico. A cholera epidemic, a devastating earthquake, a financial crisis and advertising all played a role in the growth of the bottled water industry. Cholera, the earthquake and the financial crisis all fall on the demand side of the equation, creating general distrust in the government's ability to guarantee the safety of the nation's tap water. On the supply side, by limiting public access to information and third party testing of the quality of bottled water, the private sector has been able to create an impervious image of providing a safer product.[105] There have been economic, environmental, social and political crises in Mexico that have combined to help drive distrust for the public water sector. In each of these crises, when the public sector was unable to provide safe water, the private sector stepped in. Arguably, each time this has happened the public sector has become perceived as less trust worthy and the private sector has evolved to be viewed as a safer.

This chapter examines four events in Mexico identified as the reasons the prominent and dominant rise of the bottled water industry in Mexico. One cause cited

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105 Weida, William, "A general economic critique of water resources," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007.

for the industry's rise was the outbreak of cholera in the 1990s. Hundreds of thousands of Mexicans were sickened and many died as a result of exposure to contaminated water.[106] The second factor was the earthquake of 1985 which damaged portions of Mexico City's centralized public water infrastructure. The 1985 earthquake destroyed governmental administrative buildings including the nation's water commission headquarters. While the earthquake happened before the cholera epidemic, the damaged water infrastructure was left unrepaired and thus magnified the government's inability to control the cholera epidemic. The earthquake also marks a moment when Mexican citizens began looking outside their government to resolve their problems. The 1985 earthquake even destroyed the government's water commission headquarters among dozens of other federal offices. The third factor was the financial and debt crisis that began in 1982 and lasted through 1994. This crisis left Mexico unable to make the necessary investments in the nation's public water system. The world's financial institutions came to Mexico's rescue, bringing along conditions that Mexico reform the water sector. The final factor, often overlooked, is the narrative of manufactured demand. The bottled water industry has spent billions of dollars attempting to convince consumers that tap water is dangerous and that bottled water is the only safe and healthy option. For example, even in Monterrey where older sections of the city have reliable tap water, large percentages of the population prefer bottled water.[107] In other regions not

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106 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, V10, p5.

107 Lara, Juan Antonio, "Encuesta/ Purificada o de la llave, da lo mismo," *El Norte,* Aug. 21, 2008, and IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

known for high quality tap water, such as Guadalajara, Xalapa, or Tuxtla Gutierrez, almost the entire population reports drinking only bottled water.[108] The following sections examine each of these factors in detail.

THE CHOLERA STORY

The 1990s outbreak of cholera in Mexico motivated people to seek safe drinking water sources and bottled water. Cholera is a sickness spread through contaminated water sources. The presence of cholera and the inability to control it are signs of failing and poorly maintained water systems.[109] It has been theorized that the historical outbreaks of cholera have led to investments in public drinking water systems. This chapter will discuss that theory and present evidence that water systems and water system maintenance are dependent on a community's economic capacity and that lacking this capacity. As Mexico did not have the financial capacity, it did not invest in water systems even after or during a cholera outbreak that would sicken hundreds of thousands and motivated millions to find bottled water.

Mexico's National Institute of Health Director of Epidemiology Jaime Sepulveda, stated "the year 1991 will be remembered as the one during which cholera re-entered the New World."[110] In early 1991, cholera spread to Latin America. By the

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108 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

109 WHO, *Cholera*. World Health Organization, 2014.

110 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, V10, p5.

end of 1991 were 391,220 reported cases in 16 counties throughout the Americas.[111] While more than a third of the total cases occurred in Peru, Mexico's first confirmed case was reported in June, 1991.

Sepulveda, who rose to become Mexico's Vice-Minister of Health during the crisis, defended Mexico's response to the crisis.[112] While Sepulveda paints the picture of a stable, developed nation under control of the situation, by the end of the 1991 there were 2,382 cases confirmed.[113] By 1995 the total would grow to 16,430 cases, reported by the Mexican Institute of Health. By the time the epidemic was declared over in 2001, there were 45,978 officially recognized cases from 1991 through 2001.[114] The Mexican government reports that there were no confirmed cases of cholera from 2001 until 2012.

While these are the official estimates that Mexico reported to the World Health Organization, there are discrepancies in the data. A review of articles with the words "government denies cholera" in the headline shows cases in which Mexican authorities allegedly have denied the claims of local health officials of the existence of cholera. During 2007 to 2012, while there were fewer than 10 official cases of cholera, internal reports from Mexico's health institute reported 150,000 suspected cases Mexico and the

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111 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, V10, p8.

112 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, V10, p8.

113 WHO, weekly epidemiology report. Instituto Mexicano de Salud, *Programa de Accion Especifico: 2007-2012: Cholera*, Mexico Secretaria de Salud, Subsecretaria de Prevencion y Promocion de la Salud, 2008, p19.

114 Mexico Secretary of Health, "Programa de Accion Especifico: 2007-2012: Cholera," Mexico Secretaria de Salud, Subsecretaria de Prevencion y Promocion de la Salud, 2008, p19.

distribution of 2.7 million treatments.[115] A recent outbreak in 2013 shows that Mexico is still dealing with cholera.[116]

The epidemic began "in an isolated mountainous area in the center of the country."[117] The official version of the story reports that infected drug traffickers landed on an illegal airstrip and thus spread the disease throughout the countryside.[118] The entire outbreak which began in Peru in 1991 is attributed to a single Chinese ship which dumped its sewage in a bay in Lima. "Over the next two years, this one outbreak gradually contaminated the water supply of all but two countries in Latin America, infecting five hundred thousand people."[119]

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115 Mexico Secretary of Health, "Programa de Accion Especifico: 2007-2012: Cholera," Mexico Secretaria de Salud, Subsecretaria de Prevencion y Promocion de la Salud, 2008, p19.

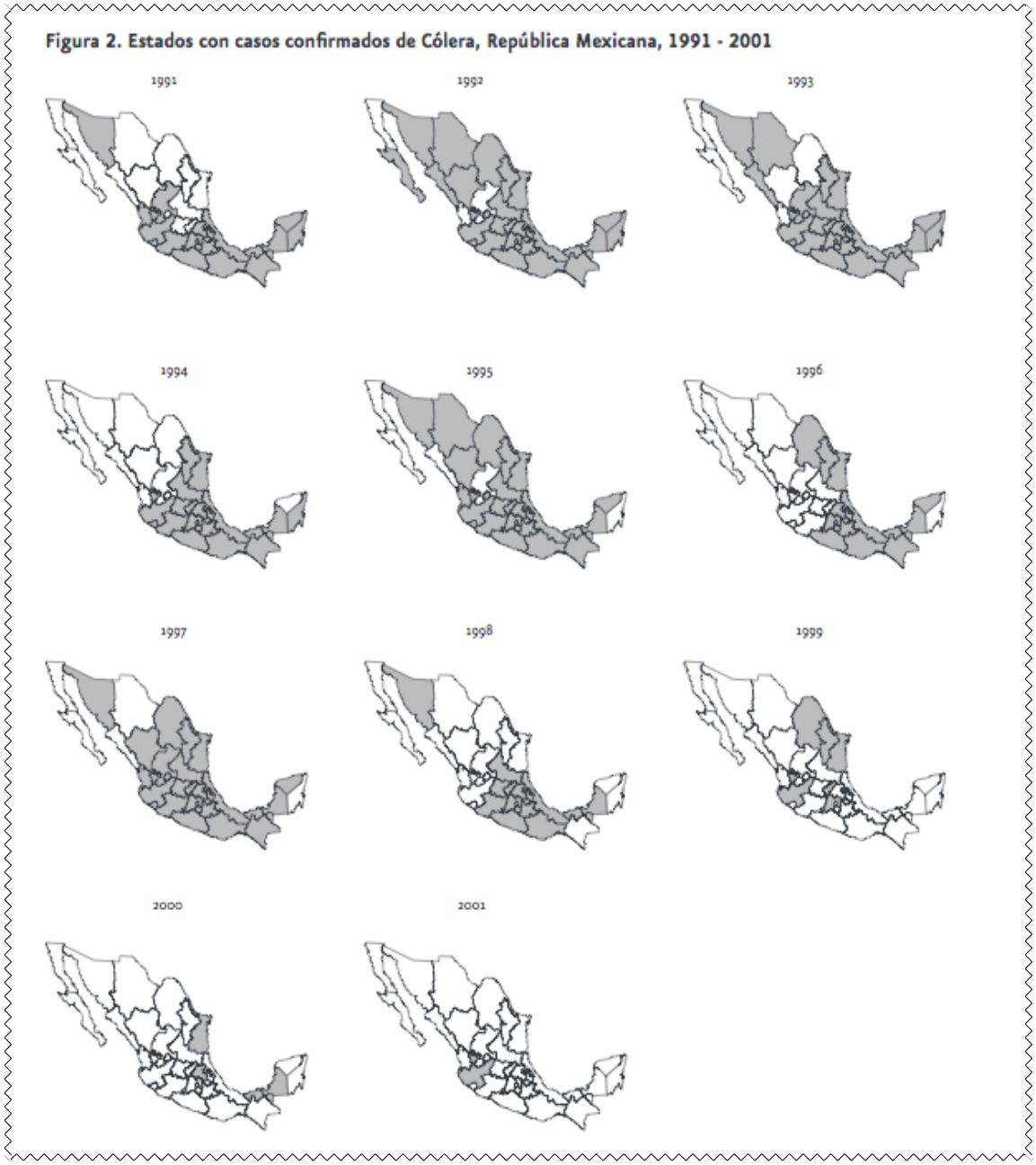
116 WHO, "Cholera in Mexico -- update," *Global Alert and Response,* Nov. 25, 2013. WHO. Cruz, Armando Sanchez, "Reporta secretario de Salud de Hidalgo mil 900 casos de colera en 2013," *La Jornada,* Dec. 20, 2013.

117 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, p8.

118 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, p8.

119 Barlow, Maude and Tony Clark, *Blue Gold: The fight to stop the corporate theft of the World's Waters,* New York Press, New York, 2002. p53.

Illustration 1: Geographic spread of cholera, 1991-2001



Source: Mexico Secretary of Health, *Programa de Accion Especifico: 2007-2012: Cholera*, Mexico Secretaria de Salud, Subsecretaria de Prevencion y Promocion de la Salud, 2008, p1.

Historically cholera has been one of the "most important causes of morbidity and mortality."[120] While the word in its present form has been with us for at least 500 years, the disease "was first described by Hippocrates in the 5th Century BC.[121] Low levels of the disease have persisted throughout time but large outbreaks have come in waves and affected millions. Seven epidemic outbreaks have occurred since the beginning of the nineteenth century.[122] The outbreak that began in 1991 in Mexico was part of the seventh wave. While cholera has been reported as controlled in Mexico, this wave of the epidemic continues.[123]

According to official reports and decrees by Mexico's federal government, cholera has been wiped out since 2001. The WHO and state agencies within Mexico present evidence that cholera continues to be an issue.[124] For example, in 2013, the WHO reports that there were 184 cases in Mexico. Also in 2013, in one single state health agency in Hidalgo, Mexico, there were 1,900 reported cases.[125] While official reports state that there have been zero cases from 2001 to 2012, official reports

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120 WHO, *Cholera,* WHO, 2014.

121 The word origin comes from Etymonline.com: the online etymology dictionary. The reference to Hippocrates comes from: Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006, v10: p4.

122 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006: p8.

123 Sepulveda, Jaime, "Cholera in Mexico: The paradoxical benefits of the last pandemic," *International Journal of Infectious Diseases,* 2006: p8.

124 WHO, "Cholera in Mexico -- update," *Global Alert and Response,* Nov. 25, 2013. WHO. Cruz, Armando Sanchez, "Reporta secretario de Salud de Hidalgo mil 900 casos de colera en 2013," *La Jornada,* Dec. 20, 2013.

125 WHO, "Cholera in Mexico -- update," *Global Alert and Response,* Nov. 25, 2013. WHO. Cruz, Armando Sanchez, "Reporta secretario de Salud de Hidalgo mil 900 casos de colera en 2013," *La Jornada,* Dec. 20, 2013.

simultaneously indicate that from just 2001 through 2006, 598,091 "suspected cases" were treated, involving the distribution of over 12 million treatment doses.[126]

Scholars who study global cholera incidence report that nations under-report outbreaks because the presence of cholera is one of the most fundamental development indicators:

> Partly because of the high cost of sanitation, the response of governments to impending cholera has often been to deny it, rather than grudgingly pay for unaffordable sanitation ... Contemporary cholera denial is so rampant that in this age of information most authorities estimate that WHO figures include fewer than 10 percent of cholera cases—perhaps as few as one percent.[127]

News stories of cholera affect trade and tourism because cholera is associated with poor sanitation and water contaminated with fecal matter. Cholera cases imply a failure in a government to provide safe drinking water to its citizens and a basic indicator of a nation's governance capacity and stability. The World Health Organization, considers the presence of "the global threat" of cholera as "one of the key indicators of social development."[128] The WHO states that it is not a threat in countries with even "minimum standards of hygiene," but that cholera continues to be a threat "where access to safe drinking water and adequate sanitation cannot be guaranteed." As such, the continued presence (and denial) of cholera in Mexico is one of the characteristics that defines Mexico as a developing nation.

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126 Mexico Secretary of Health, "Programa de Accion Especifico: 2007-2012: Cholera," Mexico Secretaria de Salud, Subsecretaria de Prevencion y Promocion de la Salud, 2008: p19.

127 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

128 WHO: "Cholera Factsheet," *Health Topics,* Global Task Force on Cholera Control, WHO, 2014.

The importance of the cholera outbreak to the bottled water industry is primal. In 1991, for the first time, the federal government recommended to its citizens that they seek safe water from private sources. As reported in Forbes:

> Beverage companies owe their strong profits in Mexico in large part to a pervasive mistrust of tap water that took root in the early 1990s amid cholera outbreaks. Health authorities encouraged Mexicans to turn to bottled water, which led to a proliferation of unregulated companies hawking "purified" water."[129]

News reports during the cholera outbreak stated that the bottled water industry was the main benefactor of the epidemic. "The problem of cholera gave rise to much of this industry, because in general Mexicans are looking for water with greater protection and lack of contamination," said the President of the National Association of Producers and Distributors of Bottled Water (ANPDAP) Gabriel Caburrubias in 2000.[130]

According to the newspaper *La Reforma,* Mexico has had bottled water companies doing business in the country for 50 years. However, it was not until 1992, shortly after the cholera outbreak, that the rush for the *oro azul* [blue gold] began.[131] "The importance of the sales of bottled water is reflected in the fact that the Bank of Mexico began [in 2002] to incorporate it in the National Consumer Price Index, utilized to calculate inflation."[132]

Some sources state that the federal effort to deal with the cholera epidemic led to an improved public water delivery system but the strong odor of chlorine led consumers

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129 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.
130 Zapata, Claudia, "Implusa colera agua emotellada," *El Norte,* Oct. 6, 2000.
131 Cruz, Antimio, "El consume purificado," *La Reforma,* July 08, 2002.
132 Cruz, Antimio, "El consume purificado," *La Reforma,* July 08, 2002.

to seek other options.[133] This is one version of what happened. In general Mexicans faced a lack of reliable information after citizens began dying of cholera.[134] The government remained silent. Armando Monroy Hermosillio, director of the Biological Science Department at Universidad Nacional Autonoma de Mexico at Iztapalapa was quoted in 2005, stating his concern that, "the government did not inform the population of Mexico City whether their tap water was apt for human consumption."[135] Hermosillio also stated that in 2005, Mexico was the "only nation in Latin America whose citizens depended entirely on bottled water." A 2002 article in the Monterrey newpaper *El Norte,* states that at that time Mexico's bottled water industry had claimed 10 percent per year growth, growth which "coincided with the reappearance of cholera."[136]

In the water treatment literature the idea of cholera as an impetus for the national or state level investment in water treatment has also been discussed. To this end, Hamlin calls it "the best-known case of the myth of the good epidemic."[137] Citing numerous articles reflecting the idea that cholera forces communities into making water treatment infrastructure investments, Hamlin says these are "the most conspicuous cases in public health of applying history to policy—or perhaps more accurately, appealing to history in political conversation."

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133 Guillen, Guillermina, "El agua inicia proceso silencioso de privatizacion en Mexico," *Noticias Financieras,* Nov. 8, 2005.

134 Guillen, Guillermina, "El agua inicia proceso silencioso de privatizacion en Mexico," *Noticias Financieras,* Nov. 8, 2005.

135 Guillen, Guillermina, "El agua inicia proceso silencioso de privatizacion en Mexico," *Noticias Financieras,* Nov. 8, 2005.

136, Cruz, Antimio, "El consume purificado," *El Norte,* July 08, 2002. This article states that Danone introduced the industry to Mexico with the brands Evian and Bonafont.

137 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

Hamlin reports that the thought that Central and South Americans would adopt sanitary reforms, modeled by the nineteenth century European and North American cases, was a vision imagined by the developed world.[138] In this way the Western world framed Latin America as a different case than that of Asia and Africa "where cholera was, at best, simply controlled by oral rehydration, antibiotics and vaccinations."[139] Latin America was less foreign and could therefore become more modern. Hamlin states that the history of England and the U.S. having invested in water infrastructure in response to cholera outbreaks is just one of several theories. Fire protection, the fire insurance industry, investors in New York investing in public infrastructure as a mechanism to circumvent banking laws and a host of other reasons are equally as likely, he suggests.[140]

One recent dissertation suggests that Coca-Cola was at least one of the architects behind modern water treatment as they tried to standardize their products first in the United States and then throughout the world.[141] Historians have noted, Hamlin states, that "outside of a few great cities, this technical achievement had come rather more recently than a cholera-as-cause model would suggest: it was a matter less of the

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138 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

139 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

140 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

141 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n4.

nineteenth century than of the first half of the twentieth."[142] In 1988 John Brown carried out a study looking at factors that would effect the probability "that a city will decide to build" water infrastructure. He used variables such as industrial demand, a community's financial resources, incidence of cholera and the cost of the system.[143] For evidence Brown examined more than 200 communities throughout the Rhineland, Westphalia, Hannover and Holstein regions of Germany. He compared data on cholera mortality, employment in the industry, per capita income from tax records and infrastructure costs based on estimates derived from population size, population density and the demand for industry. His reported that the costs, ability to pay and industrial demand were highly correlated predictors of whether a community would invest in sanitary water infrastructure. Cholera incidence did not correlate to infrastructure investment. An earlier study showed similar results.[144] "The results suggest that even during the period immediately following the cholera years of 1865-1867, crisis in public health played a secondary role to costs, industrial demand, and the income of the median voter in determining the course of sanitary reform. As the 1880s wore on, the threat of cholera all but disappeared and Rhenish towns never again experienced an epidemic."[145]

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142 Hamlin, Christopher, "'Cholera Forcing': the myth of the good epidemic and the coming of good water," *American Journal of Public Health,* November 2009.

143 Brown, John, "Public Reform for Private Gain? The Case of Investments in Sanitary Infrastructure in Germany, 1880-1887," *Urban Studies,* 1989, v26.

144 Brown, John, "Coping with Crisis? The Diffusion of Waterworks in Late Nineteenth Century German Towns," *The Journal of Economic History,* Cambridge University Press, June 1988, v48, n2.

145 Brown, John, "Coping with Crisis? The Diffusion of Waterworks in Late Nineteenth Century German Towns," *The Journal of Economic History,* Cambridge University Press, June 1988, v48, n2.

Alternative theories of why developed nations invested in sanitary water infrastructure abound. However, there is little doubt that investment in sanitation and public water infrastructure is a primary mechanism for controlling and reducing the incidence and severity of cholera. Mexico did not build public water supplies in response to this public health crisis. In fact, Mexico did not rebuild much of its colonial era water infrastructure.[146] In many regions of Mexico, including the nation's biggest cities, residents continue to be served by water infrastructure built in the eighteenth and nineteenth century.[147] They did not significantly reinvest in water treatment or even make an effort keep pace with urban and industrial growth. In general the condition of the nation's rivers and waterways worsened. In several now famous incidents public officials throughout Mexico have declared sections of rivers as open sewers in order to avoid the implications of laws that prohibit contamination, as sewers are not similarly protected.[148] The most famous of these cases occurred near the El Salto waterfalls on the Santiago River. In January 2008, an 8-year-old boy, Miguel Angel Lopez fell into the river. He was rescued immediately but within two days he fell ill: 19-days later he was dead. "Arsenic in Miguel Angel's blood was 10 times the fatal dose."[149] While the contamination of the Rio Santiago is an extreme case, throughout Mexico rivers receive

146 Ortiz, Gustavo, *Administracion del agua,* IMTA, 2001.

147 Ortiz, Gustavo, *Administracion del agua,* IMTA, 2001.

148 *El Informador,* "Nueva marcha por nino fallecido tras beber agua del rio Santiago," *El Informador,* Feb. 13, 2013.

149 Conant, Jeff, "Not a Drop to Drink," *Earth Island Journal,* Sept. 2009.

untreated waste. In 2005, only 35 percent of Mexico's population was connected to a public sewage treatment plant.[150]

While the case of Mexico does not support the theory that cholera forces investment in water infrastructure, it does offer a glimpse at how the market responds to such a dilemma. Where the government failed to act, the bottled water industry did act.

One CONAGUA official interviewed for this study reports that as the cholera epidemic broke, he began to purchase his water directly from the Coca-Cola bottling plant in Mexico City. Even though providers bring bottled water, including Coca-Cola water, directly to customer's homes they are reputed to sometimes refill the bottles with untreated tap water, even though Coca-Cola water has a higher per unit price tag, this senior official stated he was willing to commute further and pay more in order to guarantee that the water was "the good water."[151]

Cholera is at least part of the origin story of the bottled water industry in Mexico, however, so is Mexico's failure to reinvest in water infrastructure after the 1985 earthquake.

THE EARTHQUAKE STORY

Mexico's 1985 earthquake story is a second factor facilitating the growth of the bottled water industry. The earthquake that struck in 1985 was one of the largest natural disasters in recorded history. Much of Mexico City including the headquarters for the

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150 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009.
151 Interview in Austin, Texas, July 19, 2013.

national water commission and the city's water infrastructure were destroyed. Furthermore, it has been argued that the earthquake presented an opening for actors outside of Mexico to provide answers to Mexico's problems. After the earthquake the international community sent physical relief which was turned around at the border by the De la Madrid administration.[152]

The earthquake story as it is retold in this section, is entangled with the financial crisis, told in the following section. The earthquake that destroyed Mexico City's center and many of the governmental and institutional buildings of the nation's capital was the capstone of an era of unemployment, monetary devaluation and massive inflation. The earthquake left the infrastructure of the region in shambles and portions of Mexico City's water lines remain broken and unreliable even in 2013.[153]

The 8.1 magnitude earthquake that struck Mexico City on September 19, 1985 was followed 36 hours later by a "second tremor of an almost equal magnitude,"[154] an historical catastrophe.[155] "The urban concentration of Mexico City multiplied the disastrous effects of the earthquake."[156] Sources cite various death counts. Estimates

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152 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005: p256.

153 Interviews conducted in Austin with CONAGUA officials, July 19, 2013.

154 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005: p255.

155 Colegio Nacional de Enfermeras, "Mexico Earthquake," International Nursing Rev. 1986, v33. N4. And Berman, Raquel and Gloria Roel, "Encounter with Death and Destruction: The 1985 Mexico City Earthquake," *Group Analysis* 1993, v26.

156 Berman, Raquel and Gloria Roel, "Encounter with Death and Destruction: The 1985 Mexico City Earthquake," *Group Analysis* 1993, v26: p88.

suggest that 9,500 people died and 30,000 were injured.[157] "Official statements later acknowledged 5,000 killed and 14,000 injured; but an independent final tally accounted for 2 million residents temporarily made homeless and thousands dead."[158] Extreme accounts suggest that as many as 40,000 died and that, "More than 800,000 residents were ultimately forced to abandon their homes and sleep in the open air."[159]

Researchers suggest that both Mexico City's government and the national government lost significant credibility because of the earthquake.[160] It was perceived that the government was corrupt and unable to handle the crisis. The Mexican citizenry were left to fend for themselves. In the first days after the crisis the international community offered to send relief aid but the Mexican federal government refused to accept help.[161] The citizens knew that "a supply of pneumatic saws and jackhammers might have saved" lives, but the government was unable to respond.[162] "Trained international disaster teams stood at the ready while the PRI-led government deliberated and finally set up a bureaucratic fund through which all foreign aid was to be

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157 USGS, "Historic Earthquakes: Michoacan, Mexico, 1985, September 19 13:17:47," *Earthquake Hazards Program,* USGS, 2014, accessed 3/15/14 at http://earthquake.usgs.gov/earthquakes/world/events/1985_09_19.php. Clippings held by the Congressional Research Service state that more than 20,000 died from the earthquake. Murillo, Moreno, and Juan Manuel, "The 1985 Mexico earthquake," *Earth Sciences Research Journal,* 1995, no3.

158 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005, p257.

159 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005, p256.

160 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005, p256.

161 Watkins, Tom, "Corruption Seen Contributing to Quake Toll," Nov. 27, 1985.

162 Lane, Cleveland, "Mexico's Earthquake" *The New American,* Nov. 24, 1985.

channeled."[163] Instead of rescue squads the federal government sent out the army in an attempt to maintain law and order. The earthquake destroyed the city's historic center and thus the institutions "that sustained the city as a whole were disabled if not destroyed."[164]

The citizenry, who lacked even a "place to bury their dead" had "no reliable authorities to whom they could turn for assistance."[165] Even weeks later reports coming out of the devastated region painted a grim portrait of aid not reaching its destination. One account from the era attributed the diverted aid to corruption stating that even with "supplies and money flooding into the country from around the world, the truth is that those supplies have not arrived at their destination and the homeless have to find other recourses in order to survive."[166] The crumbling buildings left by the earthquake brought to light the injustices of past government collusion and corruption with private contractors.[167] Many of the buildings that collapsed, including hospitals, schools and housing projects, "had been recently constructed by the government" while older, allegedly better constructed buildings, "were unharmed."[168] Buried segmented aqueducts

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163 Lane, Cleveland, "Mexico's Earthquake" *The New American,* Nov. 24, 1985.

164 Lane, Cleveland, "Mexico's Earthquake" *The New American,* Nov. 24, 1985.

165 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005, p261.

166 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster*. 2005, p261.

167 Murillo, Moreno, and Juan Manuel, "The 1985 Mexico earthquake," *Earth Sciences Research Journal,* 1995, no3. p89.

168 Murillo, Moreno, and Juan Manuel, "The 1985 Mexico earthquake," *Earth Sciences Research Journal,* 1995, no3. p89.

located in the southeast part of the city were severely damaged.[169] The disaster destroyed the city's water supply and distribution system. "An estimated 5.3 million people [were left] without water, a condition never previously experienced in a major city."[170]

Mexico City's water system had been previously damaged and left unrepaired after a large 1979 Guerrero earthquake. The 1985 event was the final straw. There were more than 60 pipeline breaks on the main aqueduct and the primary and secondary distribution systems sustained several thousand breaks.[171] Five years later "an average of 2,000 leaks in the distribution network" were still being repaired each month.[172] Even without these breaks the water requirements of the 20 million residents of the Mexico City metropolitan zone presents "a formidable challenge" because of the natural environment.[173]

Mexico City sits in a mountain basin at 6,000 feet and relies on aquifers for 72 percent of the city's water.[174] According to a study in 1995, the pumping rates combined

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169 Gustavo Ayala, Michael J. O'Rourke, and J. Alberto Escobar, Evaluation of the Effects of the 1985 Michoacan Earthquake on the Water Systems in Metropolitan Mexico City. Earthquake Spectra: August 1990, v6, n3: p.473-496.

170 Gustavo Ayala, Michael J. O'Rourke, and J. Alberto Escobar, Evaluation of the Effects of the 1985 Michoacan Earthquake on the Water Systems in Metropolitan Mexico City. Earthquake Spectra: August 1990, v6, n3, p: 473-496.

171 A. Gustavo Ayala, Michael J. O'Rourke, and J. Alberto Escobar, Evaluation of the Effects of the 1985 Michoacan Earthquake on the Water Systems in Metropolitan Mexico City. Earthquake Spectra: August 1990, v6, n3, pp. 473-496.

172 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.63.

173 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995. Population estimate from Mexico's National Institute of Statistics and Geography (INEGI), *Mexico at a Glance 2011* and the US Central Intelligence Agency, *World FACTBOOK*, 2009.

174 United Nations, "Watersheds and Aquifers in the Green Economy," information brief, UN-Watre Decade Programme on Advocacy and Communication, 2011: accessed

with deeper extraction wells has "resulted in subsidence rates of up to 40 centimeters per year in some areas. … [The] net subsidence over the past 100 years has lowered the central, urbanized area of the [metropolitan zone of Mexico City] by an average of 7.5 meters."[175] The result has been extensive damage to the city's infrastructure, including building foundations and the sewer system.[176]

Even without the earthquake Mexico City's water supply network was in trouble. Broken water lines and open unlined wastewater canals presented the risk of cross contamination. Mexico City receives significant and severe storms that sometimes deposit 10 percent of total annual precipitation in a single event. Seasonal floods put everyone at risk as the canal waters flooded and over ran their banks. Subsidence in the city center of Mexico had grown severe enough that by the 1950s it was necessary each year to pump flooded parts of the town dry.[177] At the time of the earthquake 90 percent of residents counted on water service but 90 percent of "municipal wastewater from the MCMA [metropolitan area] remained untreated."[178] At that time 90 percent of industrial waste went untreated into the wastewater canals.[179]

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http://www.un.org/waterforlifedecade/green_economy_2011/pdf/info_brief_watersheds_and_aquifers_eng.pdf.

175 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.14

176 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.14

177 Simon, Joel, "The Sinking City," in Joseph, Gilbert and Timothy Henderson eds. *The Mexico Reader,* Duke University Press, 2003: p.524.

178 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.28

179 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.28

> "Leaks in the distribution system are a major cause of concern for both water quality and water supply. When the soil is permeated by sewage from leaking sewers and from other sources, such as unlined canals carrying sewage, then leaky pipelines will be infiltrated with contaminated water when pressure is low."[180]

The first independent study of Mexico City's tap water in 1979 revealed that 10 out of 25 samples contained "one or more of the active forms of pathogenic organisms."[181] More than a decade later another evaluation found 7 of Mexico City's 14 wastewater treatment plants were operating below capacity and the evaluation lacked data on the others.[182] Six years after the earthquake, at the time of the cholera outbreak, one report found 31 percent of the wells in the Eastern District of Mexico City failed physical and chemical water quality standards, while the State of Mexico reported 23 percent of its wells did not meet standards for coliform bacteria.[183]

Whether the region's water infrastructure was destroyed by the earthquake or subsidence or an aging system combined with a growing population, Mexico City had a higher incidence of infectious intestinal diseases and mortality than the rest of the country. The higher rates of infant mortality due to infectious diseases and water borne pathogenic deaths could be traced to regions in the south of the city which coincide with

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180 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p. 46

181 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p47

182 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p47

183 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p44.

regions where the earthquake had destroyed the water infrastructure.[184] The same is true throughout the nation as a whole. "The major cause of death among children in irregular and rural areas in Mexico continues to be diarrheal diseases."[185]

It would be a mistake to romanticize about Mexico City's water infrastructure prior to its decay. In 1990, 3 percent of households in Mexico City and 9 percent in the State of Mexico were reported to lack access to public water supplies. However, of those who used utility furnished treated domestic water supplies, in the metropolitan water service area of the State of Mexico, only 52 percent had an "in-house" water source.[186] A third of the region's 15 million people reported a "yard source." This was "a great accomplishment in light of the 17 percent" reporting an "in-house" water supply in 1960.[187] The percentage of coverage actually grew to 62 percent in 1980 but fell to 52 percent during that decade, because of the earthquake and a soaring population in need of new water connections. Throughout the region the quantity and quality of water varied and bottled water began to be seen as an alternative to a questionable public water supply. "Many poor residents substitute bottled water or soft drinks for drinking water

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184 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p52.

185 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p56.

186 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p59.

187 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995, p60.

instead of using piped water, an expensive, but presumably safe alternative to water supplies in which they have little confidence."[188]

The World Bank identified another problem in the economics of water delivery in Mexico City in the era after the earthquake. In the 1990s the city was collecting only $0.10 per cubic meter at a time when it was costing them $1.00 per cubic meter to supply the water.[189] In Mexico, water is generally considered a constitutional right. "Water use has been historically tied to the principle that water resources are the property of the state and thus should be a free, constitutional right for every citizen."[190] Older Mexicans have traditionally believed in the provision of water as part of the promise of the revolution.[191] This is at least part of the reason why CONAGUA reports that 60 million Mexicans do not pay for the tap water they receive.[192] One analyst from Global Water Intelligence refers to this situation in Mexico as an "entrenched resistance among many to paying for water."[193]

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188 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p60.

189 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.55.

190 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p.71. This is a great belief but due to the idea of the tragedy of the commons it is unlikely that a growing consumer society where water is in short supply and high demand could manage a just allocation system if water was free. Free water implies that some organizing principle other than the market will rank the importance of who gets the water they want and towards what end. A 1992 reform created a market for the rights to pump water from the ground. New users had to buy the rights from existing users, new permits were no longer granted.

191 Azuela, Antonio, "Property in the Post-Post-Revolution: Notes on the Crisis of the Constitutional Idea of Property in Contemporary Mexico," *Texas Law Review,* 2010-2011.

192 SEMERNAT, *The CONAGUA in Action: The National Water Program 2007-2012,* SEMERNAT, 2008.

193 Global Water Intelligence, "Mexico's CNA looks to fill funding gap," Global Water Intelligence, August 2005, v6, i8.

In July 2013, Mexican officials with the Comision Nacional del Agua (CONAGUA, the national commission of water) visited Austin during a bi-national water conference organized by the Lyndon B. Johnson School of Public Affairs at The University of Texas. On the last day interviews regarding their perspective on the bottled water industry in Mexico were carried out in an informal and anonymous way. One CONAGUA official, a "Technical Sublevel director" A.J., said that in his neighborhood in Mexico City the water infrastructure has been in disrepair since the earthquake. A.J. has a role both in his federal position overseeing water quality in Mexico City and as the patriarch in a large family providing safe drinking water to his family. He said he buys as many as 10 garafons per week (1 garafon holds 19 liters).[194] A.J.'s family is representative of the traditional Mexican extended family living together. He now hosts two of his daughters and several grandchildren. The 10 garafons are bought at $2 dollars each and represent a significant portion of his earnings. According to open source website information, A.J.'s salary is $588 (USD February 2014 exchange rate) per month of which more than $85 per month, 14.6 percent, is spent on bottled water.[195] A.J. also stated that he bathes his grandchildren in bottled water, as he believes that the contaminated water coming from his tap is dangerous even for bathing. The Inter-American Development Bank's bottled water use survey shows that 11 percent of Mexicans do not trust tap water to bathe infants (see Appendix 1).[196]

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194 Interviews with CONAGUA officials, July 19, 2013 in Austin.

195 CONAGUA, "Consulta de Informacion del Gobierno Federal," *Portal de Obligaciones de Transparencia,* accessed April 15, 2014 at http://www.conagua.gob.mx/directorio/

196 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

A recent New York Times article confirms this. "In Iztapalapa and in many communities across Mexico, talk of tap water is a constant – whether there is any, how it smells, what color it is, or whether it carries sand, mud or unspecified insect life."[197] Even though Mexican water officials in their official capacity have urged consumers to believe that their water is safe, once people experienced yellow odorous tap water, their faith in the public system has been broken.[198] "After having seen yellow water, brown water, people just don't want to take the risk."[199] The IDB survey confirms as 66 percent of respondents reported that "personal experience" was how they found out their water was contaminated.[200]

The following is a brief repetition of how one CONAGUA official remembers the role of the earthquake in the situation.

> The earthquake was an accelerator of the bottled water industry. After the earthquake there was no longer water in many people's homes. There were people in the streets. There was no water pressure. The biggest problem at the time was that there was no drinking water. … In some homes there was a bad smell – the smell of contamination – the pipes had broken and the water was contaminated so the people couldn't drink water from the tap.
>
> In my case, we started buying water after the earthquake in 1985. From 1985 until now. There was a problem in the administration of potable water. Solids started to show up in our water. Like earth. Since then, at least for our household, we buy 7 garafons per week. Recently that has gone up because we have a baby. We are six people with a baby but the baby is the biggest consumer of bottled water because we bathe him with

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197 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

198 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

199 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

200 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

> bottled water. The tap water has a lot of solids in it. It has sands. That's the problem. I feel as if it's an excessive expense. For instance, our food can't be washed with this water. Later I speak with my friends and they make fun of me because the bottled water might have been just filled up with tap water. But in my case we justify it because the water that we use to bathe the child doesn't have these visible contaminants and even more, we boil it.

Another official echoed the sentiment explaining how the sewer and water pipes had been ruptured and contaminated each other.

> For sure the sewer line is lower than the water line but we just don't know what condition the entire system is in. Now when we have leaks we don't know if it's the drainage line or the water line. It's disturbing to the citizens that Mexico City does not have control over the quality of water. But I think there is more to it than just that. After the earthquake you began to see foreigners traveling with their bottled water. They would bring suitcases full of bottled water when they came to visit. I think the capitalists saw the opportunity to take advantage of the situation to promote the sale of bottled water. The capitalists started to feed off the distrust of water. Everything started in Mexico City and then worked its way all the way to the village level. Now they consume bottled water all the way in the villages.

The correct response would have been to bite the bullet, rebuild the system, and improve it. Yet, at a time when Mexico could not even afford to make the most basic repairs, investing in a water system that replaced "existing elements with one which could have enhanced seismic resistance would be economically impractical."[201] "Mexico

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201 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995. P75.

City's earthquake hit right in the midst of a deepening economic crisis, which placed limits on financial resources—both public and private—for the city's reconstruction."[202]

Estimates of repair costs were beyond what Mexico as a city, a state, and a nation could pay. "Disaster research experts considered this earthquake to be one of the most destructive and economically costly of the century in terms of overall loss … with estimates for reconstruction and rehabilitation costs hovering between $5 and $10 billion."[203] As will be discussed in the next section, Mexico was already initiating austerity measures in order to pay $12 billion a year in the interest of its $96 billion of foreign debt.[204] "On the day of the earthquake, the International Monetary Fund (IMF), citing the nation's lack of economic development, canceled Mexico's line of credit."[205] In light of the destruction the IMF granted Mexico a six-month reprieve and temporarily reopened their line of credit.[206]

To further understand how the bottled water industry grew to dominance in Mexico it is useful to add a third story-line: Mexico's economic instability. Failure of the public sector is at the heart of the story of the rise of the private sector, with a "decline in living standards," and the financial crises that had gripped the country in the

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202 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster,* 2005, p.260.

203 Vale, Lawrence and Campanella, Thomas, *The Resilient City: How Modern Cities Recover from Disaster,* 2005, p.260

204 Lane (1985); Additionally, a Sept. 28, 1985 *Wall Street Journal* article by Edward Cody,

205 Lane, Cleveland, "Mexico's Earthquake" *The New American,* Nov. 24, 1985.

206 Lane, Cleveland, "Mexico's Earthquake" *The New American,* Nov. 24, 1985.

years prior to the earthquake.[207] The following chapter will examine the effect of the financial crisis.

THE FINANCIAL STORY

Mexico's financial troubles in the 1980s and 1990s contributed to its national inability to meet the infrastructure needs of the growing urban population. After the earthquake and during the cholera epidemic, Mexico could not afford to provide safe drinking water for the people. The widespread perception of corruption in key governmental institutions caused the Mexican people to look to foreign countries and foreign models of growth and the private sector for assistance. In the midst of the financial crisis, and partially because of the financial crisis, Mexico reformed management of the public water system which opened the way for the bottled water industry.

Mexico's political and economic history are tied together. The early part of the twentieth century was marked by a series of revolutions and counter-revolutions. Depending on who is retelling the narrative, the period of 1914 to 1929 can be considered one long revolutionary period or several shorter ones.[208] After an uprising that began in 1914, the Mexican Constitution was written and adopted in 1917. The

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207 Brachet-Marquez, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* 1994, v22, n9. P.1300

208 Meyer, Jean, *La Cristiada: The Mexican People's Water for Religious Liberty,* Knights of Columbus, 2013.

Constitution called for revolutionary reforms intended to end the church-state governance and return lands to the peasants. Despite the constitutional declarations, regional hacienda owners remained politically powerful and many of these reforms were not enacted for decades.

In 1926, President Plutarco Calles enforced the constitutional articles that called for the end of the relationship between the church and state. For example, the Catholic Church lands were repatriated and religious acts, including public prayer and mass, became illegal.[209] Rebellious priests were hung.[210] The reforms limiting the Church began the counter-revolution, known as the Cristero War (La Cristiada). This ended in a compromise allowing the Catholic Church to exist but excluded from politics. In 1934, President Lázaro Cárdenas' enforced the controversial Article 27 of the constitution that appropriated the nation's lands and waters into the hands of the landless peasants and ended the feudal hacienda system. Under the new Ejido system farmers did not have the right to sell their lands but they could reap rent for as long as they lived.

Mexico's golden era lasted from 1940 to 1970.[211] For nearly two decades prior to the 1970s Mexico's path was of "high and sustained growth with relatively low inflation."[212] Living standards rose steadily. Mexico stepped away from an economy

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209 Meyer, Jean, *La Cristiada: The Mexican People's Water for Religious Liberty,* Knights of Columbus, 2013.

210 Meyer, Jean, *La Cristiada: The Mexican People's Water for Religious Liberty,* Knights of Columbus, 2013.

211 Gallardo, Julio Lopez, et. al. "Financial Fragility and Financial Crisis in Mexico," *Metroeconomica*; 2006, v57, n3. This era is characterized by a GDP growth rate of 3% per year.

212 Gallardo, Julio Lopez, et. al. "Financial Fragility and Financial Crisis in Mexico," *Metroeconomica*; 2006, v57, n3.

dominated by subsistence agriculture and towards a market economy. Gains in productivity were brought about through agricultural chemistry and hybridization. Early results were astonishing: crops that traditionally produced one third of a ton at harvest began producing one, two and more tons per hectare.[213] The surplus translated into material gains as the ratio of exports to imports improved and the value of the peso stabilized. The era of good times coincided with new petroleum discoveries by the nationalized oil giant PEMEX.[214]

"Friction began in the 1970s, when discovery of enormous oil reserves triggered a feeling among Mexicans that, after a long history of relative poverty, they would be able to carry out rapid development and make Mexico a major force in world affairs."[215] The new oil reserves coincided with turmoil in the Middle East, the oil embargo and the rise of oil prices. The Mexican dream was launched.

Global oil prices rose by a factor of four from 1969 to 1979. "Rising oil exports and huge hydrocarbon reserves spawned wild growth, wild spending and wild borrowing."[216] With increased exports and increased foreign investment Mexico increased overall spending. President José López Portillo, convinced that oil prices

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213 Greene, Joshua, *Field notes from Zinacantan y Amatenango,* unpublished, 2010 (See bibliography).

214 Washington Post, "Crisis Raises Political Concerns in the U.S.," *The Washington Post,* April 16, 1983.

215 Washington Post, "Crisis Raises Political Concerns in the U.S.," *The Washington Post,* April 16, 1983.

216 Riding, Alan, "The Crisis in Mexico: Public Shocked at Plunge from Prosperity to Financial Straits Within a Few Months," *The New York Times*, Aug. 23, 1982.

would hold, presided over a period of "free spending" and borrowed billions.[217] Expansions of social programs were financed by oil revenues and the promise of future oil sales. From 1970 to 1980 Mexico's foreign debt grew from $3 billion to $57 billion.[218]

With the drop in oil prices in 1981 the good times ended in a financial crash. Oil prices fell as dramatically as they had risen.[219] Mexican federal revenues fell and the government was unable to make payments on its debts.[220] Throughout this period Mexico would take on more debt.[221] At the time of the first crash in 1982, Mexico's external debt was the largest among developing countries. Much of that debt was loaned by U.S. institutions or the IMF of which US institutions were major contributors.[222] More than half of the debt was with the United States. Bank of America and Citibank were Mexico's largest private creditors.[223] Mexico, desperate to generate earnings and foreign currency, became the biggest source of U.S. oil with terms favorable to the

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217 The Times of London, "President of Mexico who came to power in a financial crisis tackled the country's economic woes," *The Times*, April 3, 2012.

218 Goodsell, James, "Why Mexico had no choice but to nationalize banks," *The Christian Science Monitor,* Sept. 3, 1982. According to The Washington Post, "Crisis Raises Political Concerns in the U.S.," *The Washington Post,* April 16, 1983, by 1983 that debt had climbed to $80b.

219 Riding, Alan, "The Crisis in Mexico: Public Shocked at Plunge from Prosperity to Financial Straits Within a Few Months," *The New York Times*, Aug. 23, 1982.

220 Senate Foreign Relations Committee, "Twenty-Third Mexico-U.S. Interparliamentary Conference, Background Materials for U.S. Delegation Use Only," Senate Foreign Relations Committee, June 01, 1983.

221 Riding, Alan, "New debt plans set by Mexico," *New York Times,* Sept. 6, 1982.

222 Riding, Alan, "New debt plans set by Mexico," *New York Times,* Sept. 6, 1982.

223 "Twenty-Third Mexico-U.S. Interparliamentary Conference, Background Materials for U.S. Delegation Use Only," Senate Foreign Relations Committee, June 01, 1983.

U.S.[224] For the next two decades the Mexican economy would be tied directly to the price of oil. The rise and fall of the Mexican economy parallels the price of oil [see Illustration 2 and 3]. A third market crash in the mid 1990s caused yet another wave of monetary devaluation and economic restrictions.[225] A 1994 market crash led a banking crisis. By 1995 there were no loans being made in Mexico. Prior to this banks were charging 60 percent interest.[226] Illustrations 2 shows the historical price of oil and the significant fall in price n 1981. This corresponds to Illustration 3 which shows Mexico's GDP peaking in 1981-82 and then falling and stalling until the 1990s when the price of oil recovers. Illustration 3 further shows the instability of the Mexican peso as it was devalued three times from 1980 to 1994.

In 1981, Mexican government planners counted on $20b in oil sales but "exports amounted to only $14 billion."[227] "In only a matter of months, the country plunged from a period of unparalleled prosperity into its worst financial crisis in memory."[228] In 1982, in the last months of President Portillo's term in office, he ordered the nationalization of the banks. Foreign currency reserves were frozen and Mexico announced that they were

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224 Washington Post, "Crisis Raises Political Concerns in the U.S.," *The Washington Post,* April 16, 1983.

225 Flanigan, James, "Mexico's Financial Crisis: Helping Mexico is Investing in Tomorrow," *Los Angeles Times,* Feb. 01, 1995.

226 Flanigan, James, "Mexico's Financial Crisis: Helping Mexico is Investing in Tomorrow," *Los Angeles Times,* Feb. 01, 1995.

227 Cline, William, "Mexico's Crisis, The World's Peril," *Foreign Policy,* No. 49, Winter, 1982-83, p108.

228 Riding, Alan, The Crisis in Mexico: Public Shocked at Plunge from Prosperity to Financial Straits Within a Few Months, New York Times, Aug. 23, 1982.

unable to repay their debts. In the months before this, the peso "all but collapsed" and the president had few options and the future looked bleak.[229]

To meet the shortfall in revenues, the government borrowed more. Simultaneously capital flight and currency devaluation led to a rescue by the United States and the IMF on the condition that the Mexican federal government control spending. Under the 1982 debt program authored by the IMF, Mexico agreed to cut its public sector spending in half in five years, from 16 percent to 8 percent of GDP, and then to bring it down to 3 percent.[230] Several days into his administration President Miguel de la Madrid announced a 10-point program "as key elements in the austerity program required by the International Monetary Fund."[231] De la Madrid "moved quickly to reprivatize industries that came under state control through the nationalization of the banks."[232]

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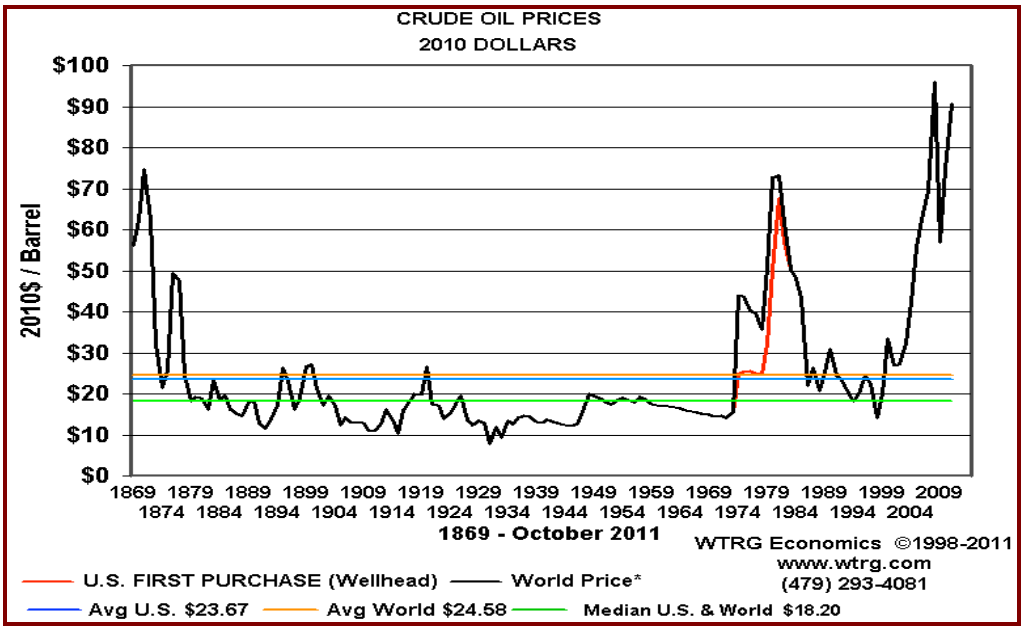
229 Goodsell, James, "Why Mexico had no choice but to nationalize banks," *The Christian Science Monitor,* Sept. 3, 1982.

230 The Washington Post, "Crisis Raises Political Concerns in the U.S.," *The Washington Post,* April 16 1983. By 1983 that debt had climbed to $80b and according to *The Times of London*, "President of Mexico who came to power in a financial crisis tackled the country's economic woes," *The Times*, April 3, 2012, in 1983, this figure was actually $100b.

231 Riding, Alan, "Bankers Cheer Mexico's Austerity Plan," *The New York Times,* Dec. 3, 1982.

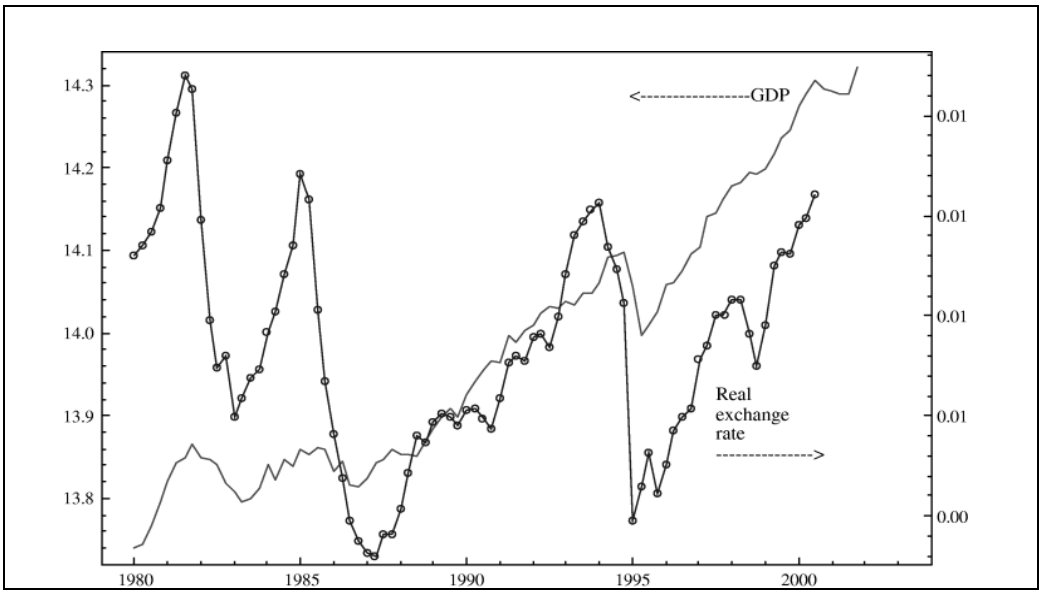
232 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78: p16.

Illustration 2: Historical Oil Prices



Source: WTRG Economics

Illustration 3: Financial Fragility and Financial Crisis in Mexico



Source: Macroeconomica, v57, i3, July 24, 2006

The country's growing indebtedness meant the debt increasingly took center stage. This increasing debt corresponds "to the increasing dominant position of transnational finance capital in Mexico's ruling bloc."[233] There was a large exodus of foreign currency as those who could flee fled and it became difficult to attract direct foreign investment. "Yet even so clearly pro-business a president was unable to coax much capital back into the country."[234]

The crisis had an effect on the quality of life on the Mexican population. Rapid industrialization had doubled the nation's Gross National Product in the 1970s. In the 1980s GNP peaked and began to decline. For example, the Gross Domestic Product per Capita (GDPPC) decreased by 15 percent from 1982-1988.[235] "During the 1982-90 period, the standards of living of the majority of Mexico's population were depressed to the point of dangerously stretching the limits of the legitimacy of the post-revolutionary regime."[236] From 1980 to 1992, real wages declined 40 to 60 percent as a result of austerity, wage controls, inflation and the removal of price controls.[237] The 1982 crisis

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233 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78, p16.

234 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78, p16.

235 Brachet-Marquez, Viviane, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* Sept. 1994, v22, n9, p1300.

236 Brachet, Marquez, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* 1-994, v22, n9, p1300.

237 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78, p17.

was followed by a sharp rise in inequality, partially attributable to the fall in oil prices.[238]

While the government's response to the earthquake cemented the public's distrust, it was preceded by national civic strikes, taking place in 1983 and again in 1984.[239] Throughout President Miguel de la Madrid's administration (1982-1986) there were numerous widespread strikes, marches and civil protests.[240] As Alan Riding correctly predicted at the time: "Poor workers and peasants, whose purchasing power actually fell because of inflation during the 1978-1981 boom, also seem certain to grow restive as the financial crisis translates an economic slump into even greater hardship."[241]

The financial crisis unfolded as a major drought affected agriculture production.[242] In addition to the impact generated by the falling price received for their exported oil, now Mexico was forced to import food.[243] The period of 1968-1976 was marked by civil strife after which, when Mexico attempted to enact austerity measures, "unions, peasant organizations, popular urban movements, and university mobilizations

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238 Calmon, Paulo Du Pin; Conceicao, Pedro; Galbraith, James; Cantu, Vidal and Abel Hibert, "The Evolution of Industrial Earnings Inequality in Mexico and Brazil," *Review of Development Economic,* UTIP Working Paper No. 5, 1998, p4.

239 Brachet-Marquez, Viviane, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* Sept. 1994, v22, n9, p1300.

240 Brachet-Marquez, Viviane, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* Sept. 1994, v22, n9, p1300.

241 Riding, Alan, "The Crisis in Mexico: Public Shocked at Plunge from Prosperity to Financial Straits Within a Few Months," *New York Times*, Aug. 23, 1982.

242 Riding, Alan, "The Crisis in Mexico: Public Shocked at Plunge from Prosperity to Financial Straits Within a Few Months," *New York Times*, Aug. 23, 1982.

243 Senate Foreign Relations Committee, "Twenty-Third Mexico-U.S. Inter-parliamentary Conference, Background Materials for U.S. Delegation Use Only," Senate Foreign Relations Committee, June 01, 1983

seriously challenged the state's traditional ability to contain class conflict."[244] Exaggerated governmental response, including the use of force, only fomented further distrust of the government.[245] These conflicts restricted the state's ability to enact the austerity measures.

Thus a Mexico already experiencing falling oil revenues faced an insufficient supply of food, hunger, drought, protests, monetary devaluation and frozen bank accounts, when the earthquake hit. Major sections of the city's water infrastructure would be left in ruins for decades.[246]

The very day of the earthquake, Sept. 19, 1985, the IMF froze Mexico's credit.[247] The banks did not plan the earthquake and thus quickly allowed Mexico a short extension but Mexico was in financial trouble. The harsh economic reality of stagnation, inflation and the roller coaster currency exchange markets would last through the 1990s. "The government responded by loosening up its stabilization policies and announcing the end of austerity."[248] The IMF responded by suspending Mexico's financing. "In response the budget was further cut in August 1985" and the earthquake "dimmed the hopes of recovery."[249] In 1987 the Mexican markets crashed again and the peso was

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244 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78.

245 McCaughan, Edward, "Mexico's Long Crisis," *Latin American Perspectives,* Summer 1993, v20, i78.

246 Joint Academies Committee on the Mexico City Water Supply, *Mexico City's Water Supply: Improving the Outlook for Sustainability,* 1995: p63.

247 Cypher, James, "Mexico: Financial Fragility or Structural Crisis?," *Journal of Economic Issues,* June 1996, v30, no2: p451-61.

248 Brachet-Marquez, Viviane, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* Sept. 1994, v22, n9: p1300.

249 Brachet-Marquez, Viviane, "Political Change and the Welfare State: The Case of Health and Food Policies in Mexico (1970-93)," *World Development,* Sept. 1994, v22, n9: p1330.

devalued and inflation soared to 150 percent.[250] The bad times would spread into the 1990s and Mexican markets would hit a new low in 1994 at the end of President Carlos Salinas de Gortari's administration (1988-1994).

The 1980s economic collapse provides the context under which President Miguel de la Madrid (1994-2000) faced the estimated billions of dollars needed to modernize and repair Mexico's municipal water supply systems. President De la Madrid opted to invite external markets. "[De la Madrid] set Mexico on the path to the free market."[251] In 1986, De la Madrid would sign the General Agreement on Tariffs and Trade committing Mexico to the World Trade Organization terms and conditions. His successor Salinas would sign North American Free Trade Agreement (NAFTA)

Mexico is a poor country. At the time of the signing of the 1994 NAFTA more than one third of Mexico's 4 million farm families were subsistence farms.[252] For comparison, at the same time the United States had 2.2 million farm families.[253] In the past century Mexico's demographics have shifted from 70 percent rural to 70 percent urban while the country's population has grown from 10 to over 100 million.[254] Despite

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250 Orme, William, Jr, "Mexican President Tackles Staglation With Tough Austerity Plan," *The Washington Post,* Dec. 20, 1987.

251 The Times, "Miguel de la Madrid; President of Mexico who came to power in a financial crisis and tackled the country's economic woes." *Times* [London, England] 3 Apr. 2012: 46. Academic OneFile. Web. 24 Jan. 2014.

252 *Rural Migration News,* "Mexican Agriculture and Trade Issues" *Rural Migration News,* UC Davis, July 1997 v2, n3.

253 USDA, *Family Farm Report*, USDA Economic Research Service, 2007; USDA, "Farms, Land in Farms, and Livestock Operations 2010 Summary," USDA, National Agriculture Statistics Service, Feb. 2011.

254 INEGI, "Proporcion de poblacion urbana y rural," *Estadisticas Historicas de Mexico,* Grafica 1.4a, INEGI, nd; and INEGI, "Mexico: Total Population, 1820-1995, *Estadisticas Historicas de Mexico,* Grafica 1.4a, INEGI, nd.

the shift from rural to urban, there are more people in Mexico's rural villages than ever before. Agricultural intensification and modernization has required fewer laborers and the supply of unemployed workers pushed wages down. Today, more than 45 percent of the nation's 117 million live below the government's official poverty line as measured in income.[255] Mexico's poverty line is $177 (April 2014 conversion) per month for people surviving in urban settings and $113 for people surviving in rural settings.[256] The poverty rate has declined in recent years but as the population has continued to grow, the absolute numbers of poor people has risen. Today 53.3 million Mexicans live below the official poverty line.[257] There are 9 percent living in extreme poverty, which is measured as those earning less than $85 per month in urban areas and $60 per month in rural areas.[258] The Mexican agency responsible for measuring poverty, CONEVAL, uses a multidimensional yardstick and shows Mexico's poverty rate to be even more extreme. CONEVAL measures intensity of deprivations and finds that only 20 percent of Mexicans "are not poor and not vulnerable."[259] The multidimensional measurement considers deprivations such as lack of access to education, access to health services,

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255 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

256 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

257 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

258 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

259 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," Wilson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

access to social security, housing quality, basic services and food security.[260] CONEVAL reports that 80 percent of Mexicans today live with one if not multiple deprivations, while the mean for Mexico as a whole is 2.4 social deprivations.[261]

In Mexico a standing joke goes: ask a farmer how they survived the great depression of 1982, or the peso devaluation of 1994. The farmer responds: "nothing changed." Despite the oil boom and subsequent market liberalizations, not much changed in the relationship between the economy and Mexico's poorest who continued to live day by day. What has changed however, is their relationship to water.

With estimated billions in needed water infrastructure repairs, Mexico found itself once again without the hard currency or the credit to build the necessary water supply or sewage systems. By 2000, 78 percent of the nation's residential wastewater and 85 percent of the nation's industrial wastewater continued to go untreated.[262] Untreated household and industrial wastewater has contaminated the nation's drinking water sources. In 2002 approximately 93 percent of the nation's surface waters were classified as contaminated.[263] Inadequate water treatment, ruptured existing water lines and rapid urban expansion combined with non-point source pollution meant that populations throughout Mexico were being exposed to contaminated water. CONAGUA

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260 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

261 Wilson, Christopher, and Geraldo Smith, "Mexico's Latest Poverty Stats," WIlson Center International Institute for Scholars, Mexico Instititute, Aug. 12, 2013.

262 Whiteford, Scott and Roberto Melville, "Water and Social Change in Mexico: An introduction," in Whiteford, Scott and Roberto Melville, eds, *Protecting a Sacred Gift: Water and Social Change in Mexico,* 2002, Center for U.S.—Mexican Studies at the University of California. p6.

263 CNA (Comision Nacional del Agua). *Compendio basico del agua en Mexico*. CNA, Mexico City, 2002.

estimated it needed $70 billion to build new or repair current treatment plants to meet the nation's needs for safe drinking water.[264] The money was just not there.[265] Mexico's financial crisis morphed into a water crisis as even the aquifers would begin to show signs of over-exploitation and in many cases, contamination. As people sought out options for the bottled water industry found an opportunity. Simply put, "when no other safe sources of drinking water are available locally, people must purchase bottled water, even though it is often more costly than gasoline."[266]

THE STORY OF MANUFACTURED DEMAND

The fourth factor that led to the rise of the bottled water industry in Mexico is manufactured demand. Because of the earthquake and the financial crisis the federal government could not supply sufficient clean water for consumer demand. The bottled water industry was able to supply a need by addressing this shortage. The cholera narrative tells a story of a consumer base seeking a safe alternative to contaminated tap water. These stories describe a supply and demand equation where the bottled water

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264 Whiteford, Scott and Roberto Melville, "Water and Social Change in Mexico: An Introduction," in Whiteford, Scott and Roberto Melville, eds, *Protecting a Sacred Gift: Water and Social Change in Mexico,* Center for U.S.—Mexican Studies at the University of California, 2002: p6.

265 Whiteford, Scott and Roberto Melville, "Water and Social Change in Mexico: An Introduction," in Whiteford, Scott and Roberto Melville, eds, *Protecting a Sacred Gift: Water and Social Change in Mexico,* Center for U.S.—Mexican Studies at the University of California, 2002: p6.

266 Whiteford, Scott and Roberto Melville, "Water and Social Change in Mexico: An Introduction," in Whiteford, Scott and Roberto Melville, eds, *Protecting a Sacred Gift: Water and Social Change in Mexico,* Center for U.S.—Mexican Studies at the University of California, 2002: p6.

industry was able to meet growing demand. Missing from the story thus far is the characterization of the bottled water industry as actor and agent.

In contrast to the other narratives, the International Bottled Water Association attributes the industry's growth to its actively "enticing consumers away from other packaged beverages perceived as less wholesome than bottled water" through advertising.[267] The bottled water industry grew at a time when per capita consumption of cola drinks leveled off and consumers became aware of their waistlines. While Mexico surged ahead of the world in per capita bottled water consumption it also led the world in Coca-Cola consumption, obesity and diabetes.[268] The four industry leaders in Mexico (Coca-Cola, Nestlé, PepsiCo. and Danone) are heavy spenders when it comes to advertising even though all four have almost global universal recognition. Coca-Cola spent $2.9 billion in global advertising in 2010.[269] Nestlé's 2013 global marketing budget was similarly $2.9 billion.[270] PepsiCo. prefers to spend advertising as a fixed percentage of revenue. While Coke spends about 8 percent of revenue on marketing PepsiCo spends 3 percent, equal to $1.7 billion in 2012.[271] Danone, the leader in Mexico, spent $1.5 billion in 2011.[272]

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267 International Bottled Water Association, *Factsheet,* 2013.

268 Miller, Tracy, "Mexico surpasses U.S. as world's fattest nation," *New York Daily News,* July 9, 2013.

269 McWilliams, Jeremiah, "Coca-Cola spent more than $2.9 billion on advertising in 2010," *The Atlantic Journal-Constitution,* Feb. 28, 2011.

270 Ad Brands, "Nestle SA," *Ad Brands Company Profiles,* Feb. 13, 2014.

271 Zmuda, Natalie, "PepsiCo Announces Millions in Additional Ad Spend, Plans to Trim Agency Roster," *Advertising Age,* Feb. 9, 2012.

272 Bruell, Alezandra, "Danone Begins Global Media Agency Review," *Advertising Age,* April 24, 2013.

Advertising giants have built an entire consumer culture around encouraging consumers to buy things that they do not need. "Global bottled water consumption has increased even though the quality of municipal tap water is improving in many countries."[273] Of course, the quality of municipal tap water did not improve in countries like Mexico. In countries like Mexico, the bottled water industry served consumers when the public sector was unable to deliver.

Advertising can help initiate habits, such as 'taking a bottle of water with you as you head off to work' or 'grabbing a bottle anytime you get in the car;' these visions of trendy, happy drinkers of bottled water were key to the development of the bottled water industry.[274] Consumers "orient their lives around consumption" and as markets get developed consumption patterns develop.[275] An examination of the bottled water industry's "early marketing strategy shows that they tried to market to emotional appeal."[276] The elite brands of bottled water were advertised as trendy, cool, and fashionable, to allow consumers to feel stylish and rich. As the beverage companies entered the market with repackaged tap water, differentiation between ostensibly equal

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273 Marcussen, Helle; Holm, Peter and Hans Hansen, "Composition, Flavor, Chemical Foodsafety and Consumer Preferences of Bottled Water," *Comprehensive Reviews in Food Science and Food Safety,* 2013, v12: p333. These authors report that global consumption had rose 23% from 2004 to 2012 to an average 30 liters per person per year.

274 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

275 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

276 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

brands required well financed advertising strategies. Bottled water was presented as clean, healthy, fit.

In the United States advertising campaigns have also counter-positioned themselves to public tap water (this was unnecessary in Mexico.) [277] In early 2000, Pepsico. Chairman Robert Morrison declared tap water to be the biggest enemy of the soft drink industry.[278] One case occurred in 2006, when top-shelf bottled water brand Fiji ran a media campaign that featured the slogan: "It says Fiji because it's not bottled in Cleveland." In its defense, the Cleveland Water Department tested Fiji and a number of other bottled waters and found that Fiji water had higher contaminant-levels Cleveland's water – although both tested below United States Safe Drinking Water Standards.[279]

Peter Gleick reports of other examples of bottled water marketing campaigns in the US disparaging tap water. "There is a war on for the hearts, minds and pocketbooks of tap water drinkers, a huge market that bottled water bottlers cannot afford to ignore."[280] Gleick promotes a movement he calls "take back the tap," which lobbies for drinking fountains and has created a phone application that locates public drinking fountains.

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[277] Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

[278], Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012, p60.

[279] Perkins, Olivera, "Don't tread on Cleveland water: Fiji ad wisecrack prompts quality test," *The Cleveland Plain Dealer,* July 19, 2006.

[280] Gleick, Peter, *Bottled and Sold,* Island Press, 2010: p6.

In the US, the clean and healthy image that the bottled water industry uses to promote itself also contrasts to the growing mistrust of governmental provision of public goods.[281] This mistrust is "fed by stories of corruption, regulatory failings, collusion" and "stories of carcinogens in the water."[282] The widespread retelling of stories of illness, such as the 1993 cryptosporidium outbreak in Milwaukee that killed 69 and sickened hundreds, contributed to the industry's growth in the United States.[283] The lack of trust in the public drinking water systems is reinforced through a mix of news stories about pathogenic outbreaks and chemical pollutants and occasional poor sensory quality of tap water.[284] For example, the contamination of a water treatment plant from a chemical spill in Charleston, West Virginia in January of 2014, turned more than 300,000 people into instant bottled water customers.[285] Months later, despite assurances from authorities, customers continued to buy bottled for drinking, cooking and washing.[286]

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281 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

282 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012.

283 Marcussen, Helle; Holm, Peter and Hans Hansen, "Composition, Flavor, Chemical Foodsafety and Consumer Preferences of Bottled Water," *Comprehensive Reviews in Food Science and Food Safety,* 2013, v12: p333.

284 Marcussen, Helle; Holm, Peter and Hans Hansen, "Composition, Flavor, Chemical Foodsafety and Consumer Preferences of Bottled Water," *Comprehensive Reviews in Food Science and Food Safety,* 2013, v12: p333.

285 Reuters, "Restaurants reopen with bottled water after West Virginia Spill," Reuters USA, Jan. 12, 2014.

286 Rogers, Heather, "Don't Drink the Water: West Virginia After the Chemical Spill," *Rolling Stone,* March 12, 2014.

While in the United States bottled water draws customers away from tap water, in Mexico, there was no need to convince consumers that tap water was unsafe. The general public was already aware and concerned of the dangers of tap water. The bottled water industry only had to convince consumers that bottled water was not tap water. In fact, distrust in the public water system is so entrenched in Mexico that even after improvements, public water utilities have a hard time convincing consumers that the water is safe.[287]

In Mexico, the industry has simply promoted the idea of itself as natural, safe, and pure. Current ad campaigns feature nothing but positive images. The market's number one selling water, Danone's Bonafont, is defined as the "light water that allows you to drink all you want." It is a useful product that "helps people to eliminate everything the body doesn't need, allowing them to feel physically and emotionally lighter."[288] Danone's ad campaigns feature slogans such as "Living Light," "Living Young," and "Living Healthy." Nestlé's Pure Life water is promoted with the slogan: "Drink better. Live better." Their website includes tips for "incorporating bottled water in our daily lives." Nestlé's encourages consumers to "join the hydration movement."[289] Coca-Cola's Ciel "is what moves you"[290] while PepsiCo.'s Aquafina is the "pure water,

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287 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

288 Danone, "Brands: Bonafont: El Agua Ligera," *Danone For All, Danone.com,* accessed April 1, 2014.

289 Nestlé, *Nestlé Pure Life: Natural Spring Water,* Nestlé, April 1, 2014. www.nestle-purelife.ca/livewell

290 Ciel, 2014, ciel.com.mx, accessed April 1, 2014.

perfect taste."[291] Throughout Mexico, ads displayed on billboards, busses and in convenience stores show fit models confidently drinking bottled water.

Market research into why consumers buy bottled water echo these advertising strategies. The reasons customers buy bottled water are: a lack of trust of the public tap system; the health benefits; and because it is trendy and youthful.[292] In slight contrast, an analyst at *The Economist* attributed the growth in the United States to "snobbery, convenience, and worries about tap water."[293]

In this age of highly evolved advertising campaigns, every aspect of the bottled water market has been analyzed and the product has been modified and repackaged to maximize consumption.[294] The mineral content, the taste, the smell, and whether the packaging "conveys luxury or casualness" have all been researched and perfected.[295] While most of the research has been dedicated to the United States bottled water consumer, similar results would be expected in Mexico.

From the mid-1980s to 2000, the bottled water industry grew from a niche market filled by special healing waters and elite brands to a market dominated by

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291 Aquafina, 2014, aquafina.com, accessed April 1, 2014.

292 Marcussen, Helle; Holm, Peter and Hans Hansen, "Composition, Flavor, Chemical Foodsafety and Consumer Preferences of Bottled Water," *Comprehensive Reviews in Food Science and Food Safety,* 2013, V12, p333.

293 The Economist, "Bottled-water industry: Waterlog" *The Economist,* July 19, 2008.

294 Anadu, Edith and Anna Harding, "Risk Perception and Bottled Water Use," *American Water Works Association,* Nov. 2000, v92. n11. and Marcussen, Helle; Holm, Peter; and C.B. Hans, "Composition, Flavor, Chemical Foodsafety and Consumer Preferences for Bottled Water," *Comprehensive Reviews in Food Science and Food Saftey,* July 2013, v12, i4.

295 Thomas, J, L, "When Visual Product Features Speak the Same Language: Effects of Shape-Typeface Congruence on Brand Perception and Price Expectation," *Journal of Product Innovation Management,* July 2011, V28, I4. Numerous studies report the taste preferences of consumers in ranges from mineral content to flavors.

multinational companies selling repackaged tap water. Foreign firms acquired Mexico's largest national bottled water companies: Coca-Cola, PepsiCo, and the Dr. Pepper Group came from the United States; Nestle from Switzerland, and Danone from France. These companies sit at the helm of what is today, "Latin America's other water infrastructure."[296] Sales of bottled water in Mexico make up a small portion of these international firms total revenues. Firms with combined annual sales larger than Mexico's foreign debt have all become household names. Byran Roberts reports that this was true all through Latin America. "Economic globalization would also appear to undermine the power of the national state. In Latin America, as elsewhere, it has eroded the significance of national boundaries for the movements of goods, capital and even people, thereby reducing the national state's control over its territory."[297]

Nestlé was the first international player in the bottled water market in Mexico in the early 1990s, followed by Danone, the owner of the high-end brand Evian.[298] Danone began to expand throughout the mid-1990s buying up local home delivery operations. In 1990, PepsiCo. revolutionized the beverage market with the Gatorade sports drink. In 1994, PespsiCo. introduced Aquafina, which they readily admitted was repackaged, filtered tap water.[299] The Coca-Cola Company entered Mexico's bottled water market in 1999 with a comparative advantage – it was already operating a well developed

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296 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

297 Roberts, Bryan, "Introduction" in Charles Wood and Bryan Roberts, eds. *Rethinking development in Latin America,* Pennsylvania State University Press, 2005.

298 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012: p249.

299 Adams, Mike, "Pepsi admits Aquafina comes from tap water," *Natural News,* Aug. 2, 2007.

decentralized bottling network and the most extensive distribution system in Mexico. The early strategy by each of these large foreign firms followed one business plan: get a foothold in the market and acquire local brands. "However," Holt writes, "once bottled water became a key profit center these companies did everything in their power to sustain the institutional underpinnings of the market, regardless of whether this perpetuated unsustainable consumption."[300]

Opponents of bottled water argue that the industry is doing more than merely advertising a product. Activists argue that the bottled water industry represents an effort by corporations to commodify a basic human need in a time of scarcity.[301] Economist William Weida argued that water provision is fundamentally a democratic issue because "private producers do not find it in their best interest to produce everything members of society want."[302] He warns that attempts by the industry to minimize liability for public safety and health issues and "may lead directly to efforts to decrease information flows about the water supply process and the quality of the product."[303]

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300 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012: p249.

301 Barlow, Maude and Tony Clark, *Blue Gold: The fight to stop the corporate theft of the World's Waters,* New York Press, New York, 2002; and Barlow, Maude and Sara Ehrhardt, "Wrung Dry: A debate on water privatization, part two," in Fishbone, Aaron, ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Association, New York, 2007. See also, Polaris Institute, "Global Water Grab: How Corporations Are Planning to Take Control of Local Water Services," in Fishbone, Aaron, ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Association, New York, 2007

302 Weida, William, "A general economic critique of water resources," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007.

303 Weida, William, "A general economic critique of water resources," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007.

Free market proponents argue that the world is better off because of bottled water.[304] People who live with contaminated tap water need clean water. One view even argues that "the public sector is largely responsible for more than 1 billion people world-wide who lack" access to safe drinking water.[305] While no one argues that Coca-Cola, PepsiCo, Nestlé and Danone are self-less actors attempting to solve the predicted water shortage problem, it is hard to imagine that 10 years ago even they could have predicted the explosive growth of the industry.

Bottling innovations also facilitated Mexico's bottled water industry. In 1985 the US Food and Drug Administration (USFDA) approved polyethylene terephthalate (PET) for packaging and this ultra-light weight plastic allowed the beverage industry to lower their marginal costs of production.[306] By the end of the 1980s companies began selling half-liter and liter sized bottles. This "allowed manufacturers to hit ever lower price points for water and the low weight and durability allowed for new consumer uses for bottled water."[307] The ability for bottled water producers to drop marginal costs of production would change the entire landscape.

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304 Segerfeldt, Frederik, "Private Water Saves Lives," in Fishbone, Aaron, ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Association, New York, 2007.

305 Segerfeldt, Frederik, "Private Water Saves Lives," in Fishbone, Aaron, ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Association, New York, 2007

306 Heinze, Sonja, "Plastic Bottles Cleared by FDA," News and Sun-Sentiinel, Ft. Lauderdale, FLA, Jan 29, 1986

307 Holt, Douglas, "Constructing Sustainable Consumption: From Ethical Values to the Cultural Transformation of Unsustainable Markets," *The Annals of the American Academy of Political and Social Science,* 2012: p245.

Finally, the rise of the bottled water industry has been accompanied by a larger societal demand for convenience.[308] In the past decades Americans have grown accustomed to the idea of shopping at a gas station or making spontaneous purchases at a convenience store. Paper plates and disposable everything are at the heart of the consumer experience, as is bottled water. Gleick, the tap water activist, points out that this has happened in parallel to the disappearance of the public drinking fountain.[309] In the United States and Mexico public works projects are carried out without the incorporation fountains on the fears of communicable diseases and the assumption that people will provide their own.

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308 Gleick, Peter, *Bottled and Sold,* Island Press, 2010: p6.

309 Gleick, Peter, *Bottled and Sold,* Island Press, 2010: p6.

CHAPTER 4: THE MAJOR PLAYERS

To understand the strategies of key firms in the Mexican bottled water market, this chapter describes in detail the investments in Mexico of two industry leaders, Groupe Danone and The Coca-Cola Company, followed by an overview of the third place PespiCo. (Nestle has a smaller presence in Mexico but because of their position as the global leader in the bottled water industry they are described in detail in Appendix 3).

Danone controls 37.3 percent of the Mexican bottled water market,[310] versus Coca-Cola's 25.9 percent,[311] and PepsiCo.'s 16.3 percent (see Table 1).[312] In Table 1 the major actors in the Mexican bottled water industry are ranked by market share and estimated sales in Mexico based on their share of the estimated $13 to $15 billion dollar industry. Table 1 also lists each firm's global revenues. Danone, Coke and PepsiCo. together control approximately 80 percent of the bottled water distribution in Mexico. The remaining 20 percent of the market is shared by Nestle and the Dr. Pepper Group along with more than 8,000 small operators currently registered with the Mexican

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310 Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011. This number is reported as 26.5% in Castrano, Ivan, "Mexico's Water War*,"* *Forbes*, March 12, 2012, and as 39.4% in Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.

311 Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011. This number is reported as 23.5% in Castrano, Ivan, "Mexico's Water War*,"* *Forbes*, March 12, 2012. This number is reported as 25.4% in Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.

312 Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011. This number is reported as 13% in Castrano, Ivan, "Mexico's Water War*,"* *Forbes*, March 12, 2012. This number is reported as 17.2% in Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.

federal government.[313] "[This] is a business model that is emerging in megacities across the developing world. Rich people pay a premium for branded jugs that can be refilled from companies owned by multinational corporations [while] in working-class neighborhoods, local entrepreneurs fill the demand."[314]

Table 1: Mexican Bottled Water Market and Rank of Largest Corporate Players;

Company	Rank in Mexico	Market Share Bottled Water Mexico (percent)	Total Global Revenues (billions)	Mexico Bottled Water Sales (as share of $13-$15b market in billions)
DANONE	1	37.5	$37	$4.0-$5.6
Coca-Cola/ FEMSA	2	25.9	$48	$3.4-$3.9
PepsiCo.	3	17.5	$65.5	$2.3-$2.6
Nestlé	4	≤ 5	$98	≤ $1

Source: all numbers compiled from company annual reports; Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011; Castrano, Ivan, "Mexico's Water War*," Forbes*, March 12, 2012, and Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.

313 Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012; and Bottledwaterweb.com, "Bottlers," *The definitive bottled water site,* accessed at: *http://www.bottledwaterweb.com/bottlersdetail.do?k=913*

314 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

GROUPE DANONE

Danone, known as Dannon in the US, grew into a bottled water giant through a circuitous route. Danone, the world's largest yogurt company, began in 1919 in Spain. In 1972 Danone merged with BSN, the owner of Evian and two other bottled waters to become France's number one bottled water company. After a series of mergers with dairy, nut, biscuit, nutrition and water companies they became Groupe Danone. In 1992 they bought Perrier's Volvic mineral water company and became the top global seller of noncarbonated mineral water.[315] In 1996 Danone bought the Chinese bottled water Wahaha, the number one brand in China, while India and Africa represent their targets of opportunity or territorial frontiers.[316] After streamlining their business model, today they focus on dairy, bottled water, baby nutrition and medical nutrition.

Danone entered the Mexican market in 1973 in a joint yogurt venture with Xalpa Industrial Company. They ended the deal with Xalpa and created Danone de Mexico in 1987.[317] In 1995 they acquired Bonafont, which today is Mexico's number one selling bottled water. Because Danone has differentiated their waters as an upscale product in Mexico it commands a higher price and higher profits than the other leading bottled waters. [318]

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315 Danone.com, "Waters," Danone.com, accessed Jan. 31, 2014 at: http://www.danone.com/en/for-all/our-4-business-lines/waters/

316 Danone.com, "Waters," Danone.com, accessed Jan. 31, 2014 at: http://www.danone.com/en/for-all/our-4-business-lines/waters/

317 Danone.com, Mexico overview.

318 Castano, Ivan, "Mexico's Water War," *Forbes,* March 12, 2012.

While ranked the top bottled water company in Mexico, Danone is the smallest in global sales. With 2012 global revenues of $37 billion, Danone is ranked #433 of the 500 biggest global corporations.[319] Danone is present in 143 countries and distributes dairy products, water and baby food. In 2012, bottled water represented about $6.6 billion or 18 percent of their total revenue.[320] On a global level, Danone ranks "No. 1 in worldwide fresh dairy products;" "No. 1 in water sales in Latin America, Asia Pacific, the Middle East and Africa;" and "No. 2 in water sales in Europe."[321] They also rank number one in baby nutrition in Europe. Rather than seek market share, Danone's current campaign is metropolitan focused: Beijing, New York City, Moscow, Rio de Janeiro, and London. In line with Danone's focus on baby nutrition and bottled water, in Mexico, they have launched a bottled water line for children: "perfect for tiny hands."[322]

Bottled water is increasingly important as Danone's bottled water sector grew by 10 percent per year in both 2011 and 2012.[323] In 2013, bottled water sales in Mexico ranked second in importance for Danone while dairy remained number one. In the

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319 Danone Annual Report, 2012; CNN, Money, and Fortune, "Fortune 500," *Fortune,* 2013. Accessed at http://money.cnn.com/magazines/fortune/fortune500.

320 Danone.com, "Waters," Danone.com, accessed Jan. 31, 2014 at: http://www.danone.com/en/for-all/our-4-business-lines/waters/

321 Danone Annual Report, 2012.

322 Danone Annual Report, 2012. Also, Danone, *Our strategic zones of development: Mexico,* Donone.com accessed Jan. 31, 2014 at: http://www.danone.com/en/for-you/journalists/basics/our-strategic-zones-of-development/puid/mexico-1/

323 Danone Annual Report 2011, and Danone Annual Report 2012.

countries where Danone is present, Mexico ranked seventh in sales volume, with 14,000 employees and 33 production facilities.[324]

Despite focusing less on European markets and more on emerging markets, Danone continues to be a French company with nationalistic tendencies.[325] There have been several takeover attempts by larger food companies but the French government has defended Danone. "Numerous French politicians … stepped forward vowing to fight to keep the company in French hands."[326] While Danone is a decidedly French company with a highly diversified global presence, Mexico has assumed a growing importance.[327]

Analysts at Danone, the owner of Evian, saw an opportunity in Mexico for an "aspirational" water with a widespread appeal. In 1995, they bought the Mexican bottled water company Bonafont with plans to develop the label. In 1994, Bonafont had $800,000 USD in sales.[328] By 2007, 13 years later they had climbed to become the number one brand in Mexico. While Danone does not disaggregate their sales by region, they are the market leader in Mexico, controlling 37.3 percent of the Mexican $13-15 billion USD market, equal to $4.8 - $5.6 billion in revenue.

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324 Ramiro, Alonso, "Precio de agua envasada sube 10% por aumento de temperatura," *Noticias Financieras,* May 11, 2011.

325 Danone.com, "2012: Over 50% of Danone's Sales Were Generated in emerging Countries," Danone history: timeline, accessed Jan. 31, 2014, at http://www.danone.com/en/for-all/history/#timeline-1919.

326 Salamate, David, "Groupe Danone," in Jay Penderson ed. *International Directory of Company Histories*, St. James Press, 2008.

326 Salamate, David, "Groupe Danone," in Jay Penderson ed. *International Directory of Company Histories*, St. James Press, 2008.

327 Salamate, David, "Groupe Danone," in Jay Penderson ed. *International Directory of Company Histories*, St. James Press, 2008.

328 Alberto, Aguilar, "Nombres, Nombres, Nombres/ Bonafont es fuerte en el agua," *El Norte,* Sept. 20, 1995.

Danone's current strategy has been to market water as a solution to Mexico's obesity epidemic. In addressing Mexican's newfound appreciation for health issues, Danone advertises that consumers should drink two liters of bottled water a day to feel "lighter, hydrated and healthy."[329] "The heart of the Danone water's strategy consists of 360º brand activation and interaction with consumers."[330] In Mexico they promote a yearly 5k run in four of the nation's biggest cities. In 2013, the company notes, 10 times as many people participated as when the company launched the initiative. Furthermore they created a specific 750ml water bottled that "is the "perfect size for runners," in the hopes of creating an interactive brand experience.[331]

Danone's recent media campaigns have pushed into the social media spheres. Danone's Evian Roller Babies ad campaign is considered one of the "most successful viral ad campaigns of all time."[332] Several of Evian's babies on roller skates ads have been viewed voluntarily by more than 70 million viewers and their top three videos have over 200 million hits.[333] Their ads whisper, drink bottled water: "Live young."

Danone's bottled water Evian is one of the important brands in the history of bottled water. For decades, even centuries, Evian was known as a medicinal mineral

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329 Danone.com, *Our strategic zones of development: Mexico,* accessed Jan. 31, 2014 at: http://www.danone.com/en/for-you/journalists/basics/our-strategic-zones-of-development/puid/mexico-1/

330 Danone.com, *Our strategic zones of development: Mexico,* accessed Jan. 31, 2014 at: http://www.danone.com/en/for-you/journalists/basics/our-strategic-zones-of-development/puid/mexico-1/

331 Danone.com: Mexico page.

332 Edwards, Jim, "Evian's babies, the most successful viral ad campaign of all time, roll again," *Business Insider,* Apr. 22, 2013.

333 Evian babies, *Youtube search: ,* YOUTUBE.com, accessed April 1, 2014 and Edwards, Jim, "Evian's babies, the most successful viral ad campaign of all time, roll again," *Business Insider,* Apr. 22, 2013.

water bottled in a small town in the French Alps. The Marquis of Lessert was reported to have been cured from an ailment after drinking this water on a daily walk in the late eighteenth century.[334] French officials authorized the sale of the in glass bottles in 1826.[335] The water's brand history claims that it originates from untouched melted snow and glacial sources.[336] Since 1824 the small town has offered healing baths. In the early twentieth century the town of Evian opened the Evian Palace and Spa and became a trendy destination for the French and global elite.[337] By the 1930s Evian branded themselves as water safe enough for babies and "after WWII European parents believed the minerals were good for breastfeeding mothers and babies."[338] In 1978, Evian "began being served in luxury restaurants and hotels in New York and Los Angeles."[339] The famed waters have enjoyed free publicity from celebrities such as Whitney Houston, Michael Jackson, and now Britney Spears, who reportedly bathe in the water.[340]

Evian is important to the evolution of bottled water because the current bottled water industry has evolved from an elite conspicuous consumption item of the past. By referring to this history, Danone is able to capitalize on consumer's fear of tap water with its squeaky clean image, even though its current bottled water business, which is

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334 Henderson, Liz, "Icons in the beginning," *The Sun-Herald,* Sydney, Australia, March 22, 2009.
335 Henderson, Liz, "Icons in the beginning," *The Sun-Herald,* Sydney, Australia, March 22, 2009.
336 Fox, "Top 10 bottled waters," *Fox News,* Aug. 06, 2013.
337 Henderson, Liz, "Icons in the beginning," *The Sun-Herald,* Sydney, Australia, March 22, 2009.
338 Henderson, Liz, "Icons in the beginning," *The Sun-Herald,* Sydney, Australia, March 22, 2009.
339 Henderson, Liz, "Icons in the beginning," *The Sun-Herald,* Sydney, Australia, March 22, 2009.
340 Daily Mail, "Evian baths, personal trainers and a team of top chefs: Britney Spears 'embarks on £100,000 bootcamp ahead of her wedding," *Daily Mail,* London, July 31, 2012. popdirt, "Michael Jackson's Bath Habits," *Popdirt,* July 8, 2004 and Eugene, Henderson, "Bathtime Whitney: I'm Evian Woman," *Mirror,* Edinburgh, Scotland, Nov. 25, 1999.

mostly in emerging markets, has nothing to do with Evian's curative waters. This is why Danone's brand Bonafont "is viewed as a more fashionable premium brand than [Coca-Cola's] Ciel." Because of this they command a higher price earning profit margins "of around 18 percent."[341]

THE COCA-COLA COMPANY

The Coca-Cola Company is the world's largest beverage company. They serve one quarter of the world's population, or 1.9 billion consumers, per day.[342] The world's 208th biggest corporation,[343] they are present in "over 200 countries," and claim the worlds largest beverage distribution system.[344] Since 1998, Mexico has led the world in per capita consumption of Coca-Cola products, and in 2010 Mexicans consumed an average of 675 servings per person year while the United States ranked fourth with 394 (see Table 2).[345] Coca-Cola brand Ciel has risen to take the number two rank in bottled water sales in Mexico.[346] They are currently investing heavily in an attempt to control the market.

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341 Castrano, Ivan, "Mexico's Water War," *Forbes*, March 12, 2012.

342 The Coca-Cola, "Front Page: Our Company," *coca-colacompany.com,* accessed April 15, 2014.

343 MoneyCNNFortune, *Fortune 500 2013*, May 20, 2013.

344 The Coca-Cola, "Front Page: Our Company," *coca-colacompany.com,* accessed April 15, 2014.

345 Coca-Cola Mexico, "Coca-Cola en el Mexico: 1986-1999," www.coca-colamexico.com.mx/historia.html, accessed Feb. 1, 2014, and Coca-Cola, "Per capita consumption of company beverage products," *Coca-Cola Annual Review 2010*.

346 Castrano, Ivan, "Mexico's Water War," *Forbes*, March 12, 2012.

Table 2 shows that since 1998 Mexico has held the number one rank in per capita consumption of Coca-Cola product consumption. In 12 years consumption in Mexico grew by more than 50 percent while during that same period the US saw a stabilization and decrease in Coca-Cola product consumption. China has exhibited 425 percent growth due to a low mean level of consumption. With steady growth and a large population China holds the greatest potential for future growth

Table 2: Per capita Coca-Cola product consumption by Key Region

Region	1998	2005	2008	2010
China	8	18	28	34
Worldwide	65	77	85	89
United States	406	431	412	394
Mexico	408	533	635	675

Source: all numbers from Coca-Cola's Ann. Rev. 2005, Ann. Rev. 2008, and Ann. Rev. 2010

In Mexico, the Coca-Cola market is split between a subdivision of The Coca-Cola Company, Coca-Cola Mexico, and Coca-Cola FEMSA, a partnership between The

Coca-Cola Company and Fomento Economico Mexicano S.A.B. de C.V. (FEMSA).[347] Coca-Cola FEMSA, which controls 50 percent of the Coca-Cola product distribution in Mexico is the second largest licensed Coca-Cola distributor in the world (The Coca-Cola Company is the first), as well as the world's largest independent Coca-Cola bottler.[348] In 2013, both companies were among the biggest beverage firms in the world: The Coca-Cola Company was the largest while FEMSA was fifth largest beverage bottler in the world.[349]

FEMSA is a holding company that controls 48 percent of the joint Mexican company Coca-Cola FEMSA while The Coca-Cola Company owns 28 percent with 22 percent of the company is publicly held.[350] Coca-Cola Mexico, a subdivision of The Coca-Cola Company, along with Coca-Cola FEMSA controlled 25.9 percent[351] of the bottled water market in Mexico while growing 19.9 percent in total sales from 2011 to 2012.[352]

While FEMSA is headquartered in Mexico, it is a transnational company. In 2013, Coca-Cola FEMSA expanded to become the biggest Coca-Cola bottler in Brazil

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347 FEMSA, *Informe Anual, 2012: Construyendo sobre nuestras fortelezas,* 2013.

348 FEMSA, "Business Units: Mexico," *Coca-Cola FEMSA,* accessed at: http://www.femsa.com/en/business/coca_cola_femsa/mexico.htm

349 Beverage World, "Global Liquid Refreshments 40" August 15, 2013. Also active in the bottled water market in Mexico, Pepsico is the second, Nestlé the third, and the Dr. Pepper Snapple Group the tenth, largest beverage firm in the world.

350 FEMSA, *Informe Anual, 2012: Construyendo sobre nuestras fortelezas,* 2013.

351 Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011, and Marketwire, "Coca-Cola FEMSA Coloca Deuda en los Mercados Internacionales de Capital por US$ 2,150 milliones," *Noticias Financieras,* Miami, Nov. 19, 2013.

352 FEMSA, *Informe Anual, 2012: Construyendo sobre nuestras fortelezas,* 2013. The actual number was $147.2 billion pesos a 19.9% increase from 2011's 123.2 billion.

and the Philippines, as well as Mexico.[353] Both Coca-Cola Mexico and Coca-Cola FEMSA operate in the Mexican Coke and bottled water market. In 2012, Coca-Cola FEMSA had $11.3 billion in sales with 73,000 employees, operating in nine countries.

Coca-Cola first registered as a brand in 1893 and had by 1930 created an international office and by 1950 had bottling operations in 45 countries. "By mid-century, the company was the single largest buyer of sugar in the world, the biggest importer of licit coca leaves in the United States, and the largest consumer of processed caffeine on the planet."[354] Bartow Elmore argues that advertising played a key role to the success. However, its distribution system was the key to its success giving the company an unequaled "ability to place a real, tangible product on retail shelves across the globe."[355] Coca-Cola FEMSA currently boasts of 5,688 distribution routes through which their 50 products, from FANTA to Coke to various brands of water gain competitive access to shelf-space in every village with road access in Mexico.[356] In many villages the only vehicles that regularly get in and out are the shiny red Coca-Cola trucks that arrive like clockwork.

Coca-Cola began selling Coke in Mexico shortly after the Mexican Revolution began in 1914. By 1929 they were licensed to bottlers in Mexico City and

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353 FEMSA, *Informe Anual, 2012: Construyendo sobre nuestras fortelezas,* 2013.

354 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n4: p718.

355 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n4: p718.

356 FEMSA, *Informe Anual, 2012: Construyendo sobre nuestras fortelezas,* 2013.

Guadalajara.[357] In 1941, Coca-Cola consolidated numerous regional bottlers and created Coca-Cola Mexico, the unique importer of the beverage maker's concentrates.[358] By 1945 Coca-Cola Mexico had 28 bottling plants in Mexico.[359] In the 1950s Coca-Cola Mexico built the only production facility making the Coca-Cola concentrate outside of the United States.[360]

Coca-Cola has been marketing in partnership with the Mexican government for decades. Coca-Cola sponsors Mexican sports, including its the largest national sporting events; the 1965 Pan American Games; the 1968 Mexico City Summer Olympics; and the National Soccer Championships in the 1970s.[361] Just as Coca-Cola in the United States became identified as an American product, in Mexico Coke became a Mexican product. In a widely circulated internet video Mexico's Ex-president Vicente Fox tells a New York journalist why Mexican Coke is better than US Coke: "It's the people," Fox says, "We put our hearts into doing Coca-Cola in Mexico. So it's sweeter and it's greater."[362]

Coke's success is at least in part explained by their strategy of supporting local as well as national clubs and sports teams throughout the world.

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357 Coca-Cola Mexico, "Coca-Cola en el Mexico: 1926-1935," www.coca-colamexico.com.mx/historia.html, accessed Feb. 1, 2014.

358 Coca-Cola Mexico, "Coca-Cola en el Mexico: 1936-1945," www.coca-colamexico.com.mx/historia.html, accessed Feb. 1, 2014.

359 359 Coca-Cola Mexico, "Coca-Cola en el Mexico: 1946-1955," www.coca-colamexico.com.mx/historia.html, accessed Feb. 1, 2014.

360 360 Coca-Cola Mexico, "Coca-Cola en el Mexico: 1946-1955," www.coca-colamexico.com.mx/historia.html, accessed Feb. 1, 2014.

361 Coca-Cola Mexico, "Coca-Cola in Mexico: 1966-1975," coca-colamexico.com.mx/historia.html, accessed Jan. 31, 2014.

362 TMZ, "Ex-President Vicente Fox – Mexican Coke is the Best in the World," TMZ, youbute.com, www.youtube.com/watch?v=AsnfzfkQYEg

> "Coke has one of the largest advertising budgets in the world, spending about $3.3 billion each year promoting its beverage portfolio, a sum that represents 33 percent of net profits. The company has spared no expense painting its signature logo on the facades of mom-and-pop shops, distributing cups at baseball games, or sponsoring local festivals and parades. The goal, as Coke's marketing team well understood, was to create connections between Coke and things people liked."[363]

After Coke entered the Mexican bottled water market in 1999, they applied marketing learned from other products. At the time Coca-Cola Mexico was already testing markets in six states with their water Ciel. In less than 15 years Coca-Cola has taken Ciel from non-existent to a $3.4 to $3.9 billion brand (see Table 2).

"The company has been successful, many have argued, because it is a 'want maker,' a company that has been successful at persuading people to buy its non-essential products."[364] When they began selling water, Coke officials were aware that it would be easy to steal their product. Filtered water could be easily reproduced and Coca-Cola needed a way to guarantee the authenticity of the Coke product.[365] The problem was resolved in 1999: each bottle of water would include a packet of minerals and flavors.[366] This would give their water a differentiated taste – impossible to replicate. Bottlers would be beholden to the company.

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363 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p21.

364 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p7.

365 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p 22.

366 Deogun, Nikhil, "The Really Real Thing: Coke to Peddle Brand of Purified Bottled Water in U.S.," *The Wall Street Journal,* Nov. 3, 1998.

According to Bartow Elmore's 2012 dissertation, water and water filtration have been at the core of The Coca-Cola Company's business model since the beginning. It was Coca-Cola's water team in the 1930s that first experimented with carbon filtration technology to de-chlorinate tap water for use at the company's bottling plants then spreading across the country.[367] Coke was also experienced in stepping in when public water systems were contaminated and undrinkable. In 1960 when an oil refinery in New Orleans contaminated the city's water "the local Coca-Cola bottler secured a fleet of tankers and imported spring water."[368] As early as the 1970s Coke's management understood that the water market was opening on the opportunities presented by a crumbling public water infrastructure. "In 1971 CEO C.A. Shillinglaw supported experimentation in bottled water considering 'the future quality of the public water supplies will continue to deteriorate, thereby generating for bottled water an increasing physical quality advantage."[369] After the introduction of Dasani, Coke promoted a restaurant campaign "Just say no to H2O," with the stated goal of teaching servers techniques to steer customers away from tap water.[370]

Globally Coca-Cola already has 53.1 percent of the carbonated beverage market. In the struggle to capitalize on the coming water shortages, they have announced plans

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367 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p 43.

368 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p. 50.

369 Shillinglaw, C.A. Letter to James A. Schroeder, March 10, 1971, Box 48, Foler 11, RWW Papers, MARBL, cited in Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p51.

370 Elmore, Bartow Jerome, *Citizen Coke: an environmental and political history of the Coca Cola Company*, dissertation in completion of doctorate at University of Virginia, 2012: p59.

to invest throughout the developing world.[371] Mexico and Brazil represent their biggest investments while China, India, the Middle East, Russia and Africa are close behind. Coca-Cola's current strategy is to become the number one brand in Mexico.[372] Today Coca-Cola Mexico has eight brands of bottled water in Mexico: Ciel Purificada, Ciel+, Ciel Mineralizada, Ciel Mini, Smart Water, Victoria, Acueducto, and Cristal. They have announced plans to double sales by 2020 by investing $1 billion per year, expanding their market, and "stepping on Bonafont's toes."[373] This announcement was coupled with the unveiling of their newest product, the 350ml bottle, perfect for children.[374] In November of 2013, Coca-Cola FEMSA sold bonds in the successful attempt to raise $2.1 billion, announcing they will use this money to invest in water treatment and bottling facilities.[375] They are playing to win, as Coca-Cola's bottled water Ciel, whose mantra is *Eso que te mueve* [It's what moves you], will get a third of the investment budget.[376]

One element of Coke's success has been an ability to partner with the public sector. Elmore argues that Coke's historical reliance on public water systems has

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371 Stafford, Leon, "Coca-Cola to spend $30 billion to grow globally," *The Atlanta Journal-Constitution,* Sept. 9, 2012, accessed on-line at http://www.ajc.com/news/business/coca-cola-to-spend-30-billion-to-grow-globally/nR6YS/

372 Castano, Ivan, "How Coke and Dannon are Fighting to Dominate the World's Largest Bottled-Water Market," *Forbes,* Jan. 31, 2012.

373 Castano, Ivan, "How Coke and Dannon are Fighting to Dominate the World's Largest Bottled-Water Market," *Forbes,* Jan. 31, 2012.

374 SEBWA, "Bottled Water Battles," *Southeastern Bottled Water Association on-line,* SEBWA, April 13, 2012.

375 Marketwire, "Coca-Cola FEMSA Coloca Deuda en los Mercados Internacionales de Capital por US$ 2,150 milliones," *Noticias Financieras,* Miami, Nov. 19, 2013.

376 Marketwire, "Coca-Cola FEMSA Coloca Deuda en los Mercados Internacionales de Capital por US$ 2,150 milliones," *Noticias Financieras,* Miami, Nov. 19, 2013.

allowed them to save on costs.[377] Furthermore, Coke was able to receive foreign assistance loans. "As Coke looked to build bottling plants in international markets, it secured federal development aid for these projects."[378] In the 1970s Coke argued that it could help the world by bringing "hydration to communities lacking basic water infrastructure abroad."[379] These loans have "helped Coke sell bottled water and other products."[380]

Coca-Cola FEMSA is a special case in Mexico because of the close relation the company has enjoyed with Mexico's political system. While Coke has always "relied on a host of private and public partners to generate the raw materials it needed," in Mexico it has enjoyed a special "presidential" relationship.[381] In Mexico the rise of Coca-Cola's bottled water industry occurred in parallel to the rise of the administration of President Vicente Fox Quesada (2000-2006). President Fox was the CEO of Coca-Cola FEMSA before becoming president. Coca-Cola FEMSA was entering the bottled water market when Fox's administration began. Fox agreed with the idea that a private sector firm could provide better services to a consumer than the public sector (See page 112 for a discussion of Fox). For example, while in office he oversaw a $250 million World Bank program, PROMAGUA, which assisted in the privatization of municipal water

377 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p718.

378 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p717.

379 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p720.

380 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p720.

381 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p719.

systems.[382] His promotion of the privatization of the water industry was based on his experiences at Coca-Cola Mexico where he rose from route manager to become its youngest CEO in history.[383]

The relationship between Coca-Cola and the leaders of Mexico is part of what Elmore describes as Coke's game plan. Elmore argues that Coke was able to grow not just by taking advantage of the overproduction of natural resources like aluminum and sugar, but also by encouraging government policies that produced these surpluses. Unlike other giant food distributors such as Hersey's, Coke did not vertically integrate their business model by buying up suppliers.[384] Elmore argues that this gave Coca-Cola advantages during booms and busts and allowed them to play their suppliers against on one another. Coke "accumulated wealth by facilitating the transfer of natural resources from overproducing suppliers to commercial retailers while minimizing financial commitments in extractive and distribution infrastructure."[385]

As Coca-Cola launches their massive capital investment campaign in Mexico, they have another advantage: raw water sources. Coca-Cola has a license to extract 29.5

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382 OECD, *OECD Studies on Water: Making Water Reform Happen in Mexico,* OECD Publishing, Jan. 8, 2013.

383 Milner, Kate, "Profile:Vicente Fox," *BBC News*, July 3, 2000.

384 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, n.4: p718.

385 Elmore, Bartow, "Citizen Coke: An environmental and Political History of the Coca-Cola Company," *Enterprise and Socity,* Dec. 2013, v14, no.4: p718.

million cubic meters (m^3) per year compared to Pepsi's 7.9 million m^3 and Danone's 4.8 million m^3.[386]

PEPSICO.

In absolute size the U.S.-based PepsiCo, which owns Lays, Doritos, Cheetos and Quaker Oats, is a larger company than The Coca-Cola Company or the Danone Group. PepsiCo is 137th on the Fortune 500 list with $65.5b in sales.[387] Pepsi once dominated the Mexican bottled water market in the early 2000s but lost share as Danone and Coca-Cola moved into the home delivery sector, and now Pepsi controls 17.5 percent of the Mexican bottled water market.[388] Pepsi merged in 2011 and 2012 with several soft drink bottlers in Mexico. Forbes analysts believed that these mergers have left Pepsi too distracted to become Mexico's top bottled water company.[389] PepsiCo. other product lines and brands including Seven-Elevens and Starbucks continue to expand in Mexico.[390]

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386 Guntur, Rohit and Hermant Challapally, "Water Wars: The Race for Emerging Markets," *Ivey Business Review,* April 2011.

387 MoneyCNNFortune, *Fortune 500 2013*, May 20, 2013.

388 Castano, Ivan, "How Coke and Dannon Are Fighting to Dominate the World's Largest Bottled-Water Market," *Forbes,* Jan. 31, 2012. Lucero, Ramiro, "Sube precio de agua envasada," *El Universal,* May 11, 2011.

389 Castano, Ivan, "How Coke and Dannon Are Fighting to Dominate the World's Largest Bottled-Water Market," *Forbes,* Jan. 31, 2012.

390 Pepsico.com.mx

NESTLÉ

In 2012, Nestlé's brand of water, *Pure Life*, became the world's leading water.[391] While Fortune 500 ranks Nestlé as the world's 69th largest company, with $98 billion in sales and $11b in profits, Nestlé does not have much presence in the bottled water market in Mexico.[392] While Nestlé's accounts for less than 5 percent of the Mexican bottled water market they remain an important player in the global bottled water market. Appendix 3 documents Nestlé's history.

CONCLUSION

In the bottled water market in Mexico, there is fierce competition underway between some of the world's biggest and most recognized beverage and food conglomerates. In the context in which Mexico rose to become the world's largest bottled water market, it is useful to evaluate the facility of the players. The Coca-Cola Company, currently Mexico's second largest bottled water company, has proven its capacity to develop delivery systems, secure water rights and political integration, and invest competitively. The larger companies, PepsiCo. and Nestle and even Danone, are equally agile. It is very likely that these companies will continue to dominate and expand the Mexican bottled water market for a long time to come.

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391 Nestlé Annual Report, 2012.

392 MoneyCNNFortune, *Fortune 500 2013*, May 20, 2013, and Nestlé Annual Report, 2012.

The story of cholera, the earthquake and the financial crisis in Mexico made bottled water a necessity owing to a lack of clean water. Through advertising and operating in a highly competitive market, the bottled water firms influenced the industry's success in Mexico. The next chapter will show how presidential politics and market reforms in Mexico also factored into the rise of the bottled water industry.

CHAPTER 5: THE POLITICAL HISTORY OF MEXICO AND THE RISE OF THE BOTTLED WATER INDUSTRY

Presidential politics and market reforms in Mexico created the conditions for the bottled water industry to thrive. Even though Mexico sought to decentralize its governance structure, beginning in the mid-1980s, it has remained a highly centralized country. This chapter will briefly discuss the presidential administrations from 1970 to the present as they have attempted to reform the public water sector. The reforms culminated with the Vicente Fox administration (2000-2006) which ensured that the bottled water market was open for business. Fox and his successors have appointed key bottled water industry insiders to the highest levels of Mexico's water commission.

The rise of the bottled water industry in Mexico occurred during a period of economic re-structuring of Mexico. Income and quality of life indicators rose from the 1940s through the 1970s, while the political system under the Partido Revolucionario Institucional (PRI), which ruled Mexico continuously from 1929 through 2000, "remained highly authoritarian."[393] Mexico's president serves a single six-year term, is the dominant political authority in the nation, "and has a strong influence on the reordering of bureaucratic domains."[394] "The Mexican president has the power to act as

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393 Rodriguez, Victoria, and Peter Ward, "Introduction: Governments of the Opposition in Mexico," in Rodriguez, Victoria, and Peter Ward eds. *Opposition Government in Mexico,* University of New Mexico Press, 1995: p3.

394 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p397.

a constituent power with the authority to amend the Constitution, to act as chief legislator, to establish himself as the ultimate authority in electoral matters, to assume jurisdiction in judicial matters, and to remove governors, municipal presidents, and legislators in the federal and state levels."[395]

Fundamental to an agricultural country like Mexico was control, allocation, and administration of the nation's waters. Philippus Wester reports that it was in part through the expansion of irrigation and the centralization of water control that the PRI "managed to keep in check sharp socio-economic differences and increase its political control over the country."[396] For a century ending in 1975, control over water was increasingly centralized in what some called Mexico's "hydrocracy" in reference to the consolidated political power of Mexico's hydraulic engineers.[397] In 1946, Mexico established the Secretaria de Recursos Hidraulicos (SRH: the Secretary of Hydraulic Resources), one of the best funded and most powerful federal agencies with the mission statement: *Por la grandeza de Mexico* [for the greatness of Mexico].[398] "This was a period in which

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395 Rodriguez, Victoria, *Decentralization in Mexico: From Reforma Municipal to Solidaridad to Nuevo Federalismo,* Westview Press, 1997: p20.

396 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p397.

397 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p397.

398 Wester, Philippus, Mollard, Eric, Silva-Ochoa, Paula and Serigo Vargas-Velazquez, "From Half-full to Half-empty: the Hydraulic Mission and Water Overexploitation in the Lerma-Chapala Basin, Mexico," in Molle, Francois and Philippus Wester eds., *River Basin Trajectories: Societies, Environments and Development,* International Water Management Institute, 2009: p.85.

Mexican development was linked to the expansion of irrigated agriculture."[399] Part of the focus of the agency was to support the industrialization "of the country by generating foreign exchange, both through the provision of cheap basic grains and the production of export crops."[400] The vision was that agricultural exports and income could be achieved through the expansion of the nation's irrigation systems.

PRESIDENT LUIS ECHEVERRIA ALVAREZ (1970-76)

Social unrest in the 1960s and the end of the economic stability and growth in the 1970s created openings for alternative political voices.[401] A major spike in oil prices tempted leaders to spend freely to quell the uproar. President Echeverria (1970-76) began an expansion of the federal bureaucracy, and "developed social welfare programs that sought to integrate the poor classes as well as to weaken extraparliamentary opposition groups and social unrest."[402] As the government expanded, SRH became increasingly well financed and powerful, so much so that from the 1960s through the

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399 Whiteford, Scott and Roberto Melville, "Water and Social Change in Mexico: An introduction," in Whiteford, Scott and Roberto Melville, eds, *Protecting a Sacred Gift: Water and Social Change in Mexico*Center for U.S.—Mexican Studies at the University of California, 2002: p16.

400 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: 400.

401 Rodriguez, Victoria, and Peter Ward, "Introduction: Governments of the Opposition in Mexico," in Rodriguez, Victoria, and Peter Ward eds. *Opposition Government in Mexico,* University of New Mexico Press, 1995: p5.

402 Rodriguez, Victoria, and Peter Ward, "Introduction: Governments of the Opposition in Mexico," in Rodriguez, Victoria, and Peter Ward eds. *Opposition Government in Mexico,* University of New Mexico Press, 1995: p5.

1970s the agency became successful on its own in securing international loans. SRH provided the government access to "urgently needed foreign reserves."[403]

Under Echeverria the 1972 *Ley Federal de Aguas* consolidated all water infrastructure planning, construction, and development under SRH and prohibited local user management of water districts.[404] Jose López-Portillo, who before becoming president, was the minister of finance under President Echeverria, tried to control the SRH but failed.[405] In 1976, when he ran for president, key groups of "hydrocrats," senior engineers who ran the SRH, supported his opponent.[406] When he became president, Portillo ended the Ministry of Hydraulic Resources' reign over Mexico.

PRESIDENT JOSE LOPEZ PORTILLO (1976-1982)

Jose Lopez Portillo sought to decentralize water administration as a key government goal by placing SRH under the control of the Ministry of Agriculture in

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403 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p401. "From 1966 to 1975, foreign loans constituted more than 15% of SRH's irrigation investments on average."

404 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p401.

405 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p404.

406 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p404.

1976, putting the hydrologists under the agronomists.[407] The plan was to reduce the power "of a network of hydrological engineers," and change the country's path to development.[408]

Industry growth and agricultural outputs are dependent on access to water.[409] Even now, Mexico's water consumption continues to be dominated by agricultural use. In 2000, Mexico's agricultural sector accounted for 79 percent of the total water extraction while the industrial sector accounted for only 4 percent.[410] Water policy in Mexico has been at the heart of the nation's attempt to modernize, globalize and industrialize.[411] During the boom years of the 1970s leaders began to envision a modern, globally integrated Mexico. "This was evident in the 1980s when the state embraced the

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407 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p17.Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p401. See also Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002, p17. These authors suggest that while Portillo publicly stated his intention for combining the water ministry under the agriculture ministry was to enhance coordination, the actual goal "was to reduce the autonomy of a network of hydrological engineers."

408 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p17.

409 Solomon, Steven. *Water: The Epic Struggle for Wealth, Power, and Civilization*. New York: Harper, 2010: p16.

410 Ortiz, Gustavo, *Administracion del agua,* IMTA, 2001.

411 Monsalvo, Gabriela Velazquez; Zapata, Emma Martelo and Pilar Alberti Manzanares, "The Transfer of Irrigation Districts: Dynamics of Gender Relations," in Whiteford, Scott and Robert Melville eds, *Protecting a sacred gift: Water and social change in Mexico,* Center for US-Mexican Studies at the University of California, San Diego, 2002: p88.

neoliberal model, acknowledging that the farming sector was no longer the country's development generator nor a national priority."[412]

Meanwhile, in 1977, at the United Nations' Water Resource Conference in Mar del Plata, Argentina, U.N. Secretary General Kurt Waldheim warned that water had to be protected to avoid disastrous consequences of increased demand as populations grew.[413] Future conferences would mark this as the beginning of the shift towards a market option as a solution to the water crisis.[414] Garrett Hardin's *The Tragedy of the Commons* (1968) began to make waves throughout the economics and environmental fields. According to some analysts, privatization and the establishment of transferable property rights will protect water resources.[415] "The argument goes that consumers will use water more efficiently if they are made to pay per unit volume of water at cost-reflective prices."[416] Others argue that privatization and commodification of public goods is less about resource protection than appropriation of resources and profits.[417]

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412 Monsalvo, Gabriela Velazquez; Zapata, Emma Martelo and Pilar Alberti Manzanares, "The Transfer of Irrigation Districts: Dynamics of Gender Relations," in Whiteford, Scott and Robert Melville eds, *Protecting a sacred gift: Water and social change in Mexico,* Center for US-Mexican Studies at the University of California, San Diego, 2002: p88.

413 Onis, Juan, "International Cooperation Stressed as UN Water Conference Opens," *The New York Times,* March 15, 1977.

414 Hardin, Garrett, "The Tragedy of the Commons," *Science,* Dec. 13, 1968, v162, n3859.

415 Segerfeldt, Fredrik, "Private Water Saves Lives," reprinted in Fishbone, Aaron ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Education Association, 2007. See also, Haley, Michelle, "Water Commodification: A study of the bottled water industry," thesis from California State University, Fullerton, 2011: p28.

416 Haley, Michelle, "Water Commodification: A study of the bottled water industry," thesis from California State University, Fullerton, 2011: p28.

417 Haley, Michelle, "Water Commodification: A study of the bottled water industry," thesis from California State University, Fullerton, 2011: p23-30.

PRESIDENT MIGUEL DE LA MADRID (1982-1988)

President Miguel de la Madrid continued the decentralization of the federal government. He became president in the midst of an unfolding economic crisis. Funding for water projects was cut in half.[418] "The World Bank stopped lending to Mexico."[419] Mexico's modernization project ground to a halt. De la Madrid, an economist, was torn between the needs of distressed Mexicans and the demands of the world financial institutions. De la Madrid "adopted a neoliberal approach that strongly departed from the populist and interventionist economic policies followed by previous presidents."[420] He ordered all federal agencies to decentralize and gave municipal authorities responsibility for the management of drinking water systems.[421] The 1985 earthquake destroyed the Ministry of Agriculture and Hydraulic Resources offices.[422] A year after the earthquakes, in 1986, De la Madrid created a National Institute for Water Technology, the Instituto Mexicano de Tecnologia del Agua (IMTA). IMTA's mandate

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418 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p405.

419 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p405.

420 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p406.

421 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p17.

422 Orme, William, "Thousands Still Homeless 1 Year After Mexico Quake," *The Washington Post,* Sept. 20, 1986.

was to "modernize water management and distribution" throughout Mexico.[423] According to one perspective, De la Madrid won the election by agreeing to bring the water engineers (the hydrocracy), back to power, but the financial crisis and the earthquakes physical destruction of federal buildings reduced his ability to reorganize the ministries.[424]

CARLOS SALINAS GORTARI (1988-1994)

Madrid's successor Carlos Salinas Gortari (1988-1994) created the national water commission, (CONAGUA: Comisión Nacional de Agua) in 1989. Salinas also pushed an agenda aimed at reducing government spending through decentralization and sharing the responsibility for public water infrastructure through public-private-partnerships (PPPs).[425] The original intention was to organize the agency into six administrative river basin regions and thus diffuse its influence. CONAGUA's charter charged it with two functions directly related to the rise of the bottled water industry: defining water policies and granting water concessions.[426]

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423 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p17.

424 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p406.

425 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p406.

426 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p406.

CONAGUA set the stage for the major reforms in the water sector that were to come. Beset by the financial crisis and the destruction left by the earthquakes, CONAGUA published recommendations in 1989 to create a modern, functioning water management system. The report focused on the "substandard conditions of the water supply;" the low technical skill level of the nation's professional water management staff; and "low levels of revenue collection."[427] CONAGUA recommended "increasing decentralization, autonomy, self-sufficiency, and private participation in the provision of water supply service."[428] This was enacted in 1992 as the National Water Law, pushed through by Salinas. The reform attempted to empower business-oriented municipio (county) level agencies to manage the water supply. CONAGUA also recommended that local water utilities begin to suspend service for uncollected tariffs."[429] Suspending water services in a country where water is seen as a constitutional right was radical. The 1992 law delegated the states to carry out the reforms. By 1995, 80 percent of the country's water resources, irrigation canals, and water districts were administered with what was essentially a business approach to the allocation of water.[430]

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427 Pineda, Nicolas, "Water Supply Performance, Policy, and Politics on Mexico's Northern Border," in in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p165.

428 Pineda, Nicolas, "Water Supply Performance, Policy, and Politics on Mexico's Northern Border," in in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p165.

429 Pineda, Nicolas, "Water Supply Performance, Policy, and Politics on Mexico's Northern Border," in in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p165.

430 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p18.

Despite pushing for administration at the local level the new law also returned CONAGUA and the "hydrocracy" as "the country's sole water authority."[431] This was what Victoria Rodriguez has called strengthening the center through decentralization.[432] The reforms added full-cost pricing mechanisms allowing CONAGUA to become financially independent. Regional and local water districts were granted water concessions by CONAGUA and then expected to collect fees for system maintenance. The new law allowed transferable water rights: "The water law sought to encourage water markets through the introduction of market mechanisms, pricing and other economic incentives to encourage more efficient use of water."[433]

In 1992 the International Conference on Water and the Environment (ICWE) in Dublin defined water as an economic good in its principle number four: "Water has an economic value in all its competing uses and should be recognized as an economic good. … Managing water as an economic good is an important way of achieving efficient and equitable use and of encouraging conservation and protection of water resources."[434] This shift in strategy over water resource management was reinforced at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro,

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431 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p401.

432 Rodriguez, Victoria, *Decentralization in Mexico: From Reforma Municipal to Solidaridad to Nuevo Federalismo,* Westview Press, 1997.

433 Ahlers, Rhodante, "Moving in or staying out: Gender dimensions of water markets," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002.

434 "The Dublin Statement on Water and Sustainable Development," in Fishbone, Aaron, ed. *The Struggle for Water: Increasing Demands on a Vital Resource,* International Debate Association, New York, 2007, *p*243. See also Sjölander, Ann-Christin, *The Water Business: Corporations Versus People,* Zed Books, 2005: p11-12.

Brazil. Michelle Haley has argued that ICWE and UNCED opened the door to the expansion of a private the bottled water industry. "The conferences in both Dublin and Rio … represent a fundamentally new way of dealing with global water issues. Now considered a commodity, the allocation, conservation and protection of freshwater resources would be optimized through free market mechanisms."[435]

Mexico's 1992 National Water Law enabled the bottled water industry's rise by allowing a transfer of water rights from the public sphere to the private sphere "permitted trading in water allocation rights."[436] This shift was intended to address both the absence of federal funding and the allocation of scarce water in a time of increasing demand. Under the new law, once water rights were allocated the federal government would prohibit drilling new wells. New users would have to purchase the rights from an existing water user.[437]

The changes in the water sector reflected larger changes in Mexico's economy. "In the 1990s while the role of the Mexican state was scaled back through the privatization and liberalization processes that eased the fiscal pressures, the private sector was playing a larger role in driving the capital markets."[438] The larger changes included: "economic reorganization; national market openness; elimination of

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435 Haley, Michelle, "Water Commodification: A study of the bottled water industry," thesis for completion of a Masters degree in geography from California State University, Fullerton, 2011: p33.

436 Ahlers, Rhodante, "Moving in or staying out: Gender dimensions of water markets," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p65.

437 Whiteford, Scott and Robert Melville, "Water and Social Change in Mexico: An introduction," in *Protecting a sacred gift: water and social change in Mexico,* Whiteford and Melville eds. Center for US-Mexican Studies at the University of California, San Diego, 2002: p17.

438 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneuriship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2.

commercial barriers; privatization of public enterprises and state property;" and a "reduction of social policy expenses."[439] These reforms were intended to increase competition and improve efficiency and provide a downward pressure on prices.[440]

At the end of the Salinas administration hundreds of state owned enterprises were sold or closed. "By June of 1992, the Mexican government had privatized 361 out of approximately 1,200 enterprises … By 1993 only 213 remained in state hands."[441] In the water sector these reforms meant an increased reliance on the private sector.

PRESIDENT ERNESTO ZEDILLO (1994-2000)

Ernesto Zedillo was the last president of the PRI's 71-year single party rule over Mexico. Of the 416 constitutional reforms passed between 1917 and 2004, Zedillo passed 76 (18 percent), reflecting both his activism and his political agility.[442] Water policy was central to Zedillo's reforms, as CONAGUA was moved out of the department of agriculture (SARH) and into the national environment agency (SEMARNAP).[443] As with reforms under Salinas, the changes under Zedillo were also intended to strengthen the center while decentralizing. State water commissions were

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439 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneurship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2.

440 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneurship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2.

441 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneurship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2.

442 World Bank, *Democratic governance in Mexico: Beyond state capture and social polarization*," The International Bank for Reconstruction and Development, 2007: p58.

443 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p408

empowered but final decisions and project financing continued to emanate from CONAGUA's central office.[444] "Between 1995 and 2000, the centralising tendencies in the hydrocracy were very strong and proved stronger than the policy current in [CONAGUA] aiming for decentralised water management."[445] Publicly criticized by the state governments and water users increasingly discredited CONAGUA.[446] "With the election of a non-PRI president in 2000, hopes were high that 'deep' institutional change would occur in the water sector."[447]

PRESIDENT VICENTE FOX QUESADA (2000-2006)

President Vicente Fox continued to integrate Mexican markets into the global economy. Fox, the CEO of Coca-Cola Mexico prior to becoming president, truly believed in the private sector's ability to deliver services. He intended to run Mexico like a business and in that respect, his ascendancy to power resulted in "a direct, immediate switch to managerial power."[448] Political power in Mexico was committed to the interests of "transnational capitalism exercising a new governance strategy. This

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444 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p407.

445 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p409.

446 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p409.

447 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p409.

448 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneuriship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2: p242.

strategy allowed them to dominate and directly control the means for achieving their maximum benefit."[449]

Philippus Wester reported that President Vicente Fox was unable to accomplish much during his administration.[450] It was the first presidency since 1929 that was not from the PRI party. During Fox's term the PRI still controlled important loyalties embedded deep within the state bureaucracy and in the Senate and Congress. Meeting the water infrastructure needs of the nation continued to require investments and faith in public water systems was decreasing.[451] In 2002, CONAGUA reported they needed $1.8 billion (USD 2002) to upgrade and maintain the nation's water infrastructure.[452] That year the Mexican congress only approved $1 billion, a shortfall of 44 percent.[453]

From the bottled water industry's vantage, the Fox presidency was effective. Coca-Cola's bottled water sales in Mexico during the Fox administration provide an illustration of how private and public interests lined up to aid the rise of the bottled water industry. In 2002, Coca Cola Company's Annual Report forecasted: "over the next ten years, bottled water is expected to become the world's largest beverage category."[454] In one year, from 2002 to 2003, Coca-Cola FEMSA reported a 96 percent compound

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449 Vargas-Hernadez, Jose, "A Chronological Study of Entrepreneuriship and Ownership in Mexican Governance Since 1982," *Journal of Politics and Law,* Sept. 2010, v3, n2: p242.

450 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p.408.

451 Enciso, Angelica, "20 millones de mexicanos, sin perspectivas de contar con agua potable y alcantarillado: CNA," *La Jornada,* July 20, 2002.

452 Enciso, Angelica, "20 millones de mexicanos, sin perspectivas de contar con agua potable y alcantarillado: CNA," *La Jornada,* July 20, 2002.

453 Enciso, Angelica, "20 millones de mexicanos, sin perspectivas de contar con agua potable y alcantarillado: CNA," *La Jornada,* July 20, 2002.

454 Coca-Cola Annual Report 2002.

annual rate of growth (CARG), as revenues doubled from $2 billion to $4 billion, while the Coca-Cola bottled water brand Ciel grew by 48 percent.[455] Throughout Fox's presidency Coca-Cola FEMSA's revenues would triple.[456] Mexico accounted for 44 percent of Coca-Cola FEMSA's geographical domain in Latin America and Southeast Asia, Mexico had the strongest and fastest growing sector, exhibiting "a strong platform for future competitiveness."[457] During Fox's administration Mexico would be come the number one per capita consumer of Coca-Cola products in the world surpassing the next consumers: Malta, Chile and The United States (see Table 2).

The legend of Vicente "The Coca-Cola Kid" Fox is that he grew up in a *rancho*, which in Mexico is a small rural village. He campaigned as the only candidate to have ever milked a cow.[458] While that was part of his marketing savvy, Fox was no hayseed, but the son of a wealthy farmer who raised cattle, ostriches and crops for export.[459] Another legend, says that Fox is a Harvard-educated businessman.[460] As a marketing king Fox knew how to spin a story; when he ran for president Fox found it easier to direct the press' imagination than to correct the many fanciful tales. Stories abound of his attending Harvard but Harvard has no record of his matriculation; the *Chicago Tribune* reported that the confusion stems from his attendance at a weeklong Coca-Cola

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455 Coca-Cola FEMSA Informe Anual 2003/ 2002.

456 Coca-Cola FEMSA Informe Anual 2006/ 2005/ 2004/ 2003/ 2002.

457 Coca-Cola Company Annual Report 2002.

458 Milner, Kate, "Profile:Vicente Fox," *BBC News*, July 3, 2000.

459 Milner, Kate, "Profile:Vicente Fox," *BBC News*, July 3, 2000.

460 Numerous articles and sources including Wikipedia incorrectly claim that Fox had an MBA from Harvard Business School.

sponsored event at Harvard.[461] Another legend paints him as working at Coca-Cola as a young boy delivering Coke's to rural villages or corner stores in the big cities.[462] Fox claims that he has seen more of Mexico than most, having travelled every delivery route of the company in the country.[463] More realistically, he went off to college where he studied business and went to work for Coca-Cola Mexico where he joined as a route supervisor and says he rode every one of the company's 2,500 routes at that time.[464] By 1979 Fox had risen within the corporate structure of Coca-Cola to become the president of Coca-Cola Mexico.

Fox was a Coca-Cola man.[465] After his election his first appointment to head CONAGUA was another former Coca-Cola CEO, Cristobal Jaime Jaquez.[466] Both men clearly believed the way forward in the water sector was through public-private-partnerships.[467] Fox and Jaime introduced PROMAGUA, a program financed by $250 million from the World Bank to finance the privatization of the country's water resources.[468] Under the program PROMAGUA would provide public financing of 20

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461 Correction, *"Corrections," Chicago Tribune,* Jan. 25, 2001.

462 Milner, Kate, "Profile:Vicente Fox," *BBC News*, July 3, 2000.

463 Milner, Kate, "Profile:Vicente Fox," *BBC News*, July 3, 2000.

464 Dadilla, Xardiel, "Frente a frente: Vicente Fox Quesada 'Hay que ser transparente," *El Norte,* May 31, 1995.

465 Blanding, Michael, *The Coke Machine: The Dirty Truth Behind the World's Favorite Soft Drink,"* Penguin Group, New York, 2010.

466 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3, p409; Moreno, Daniel, "Ofrece nueva gestion desterrar el espionaje," *El Norte,* Nov. 28, 2000.

467 Castro, Claudia Reyna, "Urgen a Mexico nuevas inversiones en infraestructura del agua," *NoticiasFinancieras,* Feb. 2, 2006.

468 OECD, *OECD Studies on Water: Making Water Reform Happen in Mexico,* OECD Publishing, Jan. 8, 2013.

percent to 49 percent of the initial investment cost depending on the efficiency of the operation.[469] Large international water management firms such as Vivendi and Suez invested heavily in the Mexican water system management. Ninety percent of Mexico's largest urban centers shifted from public utilities to private management of water resources at that time.[470] Yet, because of financial instability and the persistent problem of low levels of tariff collection, the world's private water management companies were reevaluating investments in the developing world.[471]

According to *Global Water Intelligence,* Mexico between 2000 and 2006, was a risky market for the private sector.[472] Mexican water tariffs are set by populist criteria, decided at the municipal level, making it politically expensive for local governments to enact price increases. The national association of water and sanitation businesses, ANEAS estimated that in 2004, the entire water sector required additional investments of more than $2 billion per year for 25 years to provide Mexico with clean drinking water and treat the nation's sewage.[473] At that time Mexico federal funding for the water sector was at a the historically high level: $1 billion. This discrepancy between needs and funds led CONAGUA Director Cristobal Jaime Jaquez to state: "Making resources sustainable to strengthen the water sector cannot be done by good will alone. We need

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469 GWI, "Mexico: Time to get serious," *Global Water Intelligence,* Sept. 2004, v5, i9.

470 Barlow, Maude, and Tony Clarke, "Water Privatization," *Global Policy Forum,* 2004, accessed April 4, 2014, at http://www.globalpolicy.org/component/content/article/209/43398.html

471 Sjölander, Ann-Christin, *The Water Business: Corporations Versus People,* Zed Books, 2005: p51.

472 GWI, "Mexico: Time to get serious," *Global Water Intelligence,* Sept. 2004, v5, i9.

473 GWI, "Mexico: Time to get serious," *Global Water Intelligence,* Sept. 2004, v5, i9.

capital and that must come from outside the government."[474] Mexico's water infrastructure was in need of investment and while the World Bank and private companies were willing to take the risk, these were tough, vulnerable, and risky markets.

> Water pricing, or cost-recovery, is essentially a political issue.[475]
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> "The benefits are not fully recognised, therefore funds are difficult to mobilise, resulting in lower than needed investments and inadequate maintenance of infrastructure and in the difficulty of attracting good quality resources to the water sector … This in turn results in low quality services, which reinforces the cycle by further reducing their value in the eyes of users and governments."[476]

In Mexico the privatization of water management met with mixed results. Despite the fact that 90 percent of households were connected to a public water supply, in 2004, only 52 percent of households had a water meter.[477] Water and wastewater bills, excluding bottled water, as a share of average net disposable income is only 0.2 percent in Mexico, which is among the lowest of the OECD countries.[478] The United States, with a much high disposable income, pays 0.3 percent towards water and wastewater while France and the United Kingdom spend 0.7 percent of disposable income.[479] While this is affordable for Mexican households it is not enough money to maintain or expand

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474 GWI, "Mexico: Time to get serious," *Global Water Intelligence,* Sept. 2004, v5, i9.

475 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p27.

476 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p.28.

477 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p.81.

478 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p.87.

479 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p.87.

the public water system. In this context, the private firms that sought to manage Mexico's waters encountered difficulties and were unable to expand. "High capital intensity, large initial outlays, long payback periods, immobility and invisibility of assets, and low rates of return generate high risks. These factors … constitute important constraints on private sector participation in water and sanitation infrastructure."[480]

The bottled water industry however, was able to avoid the greatest of these risks: high capital costs for the water distribution systems. Without investing in infrastructure and by selling directly to consumers without having to publicly negotiate rates, the bottled water industry proved to be the profitable way forward. OECD estimates that infrastructure maintenance and investment represents 85 percent of the cost of providing water.[481] The bottled water industry is able to avoid most of the costs of production and charge hundreds, even thousands of times the public per-unit water price (see Appendix 2). Household tap water in Mexico currently averages $0.69 per 1,000 liters.[482] The most expensive one liter bottle of Evian or Fiji water at a Mexican convenient store costs approximately $2, or 2,890 times as expensive. The bottled water industry's argument is that the risks and probability of illness associated with drinking contaminated tap water may make this price difference justifiable to a consumer.

In 2004, the Fox administration and the Senate passed sweeping reforms attempting once again to decentralize the nation's water management. The 2004 reform

480 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p105.
481 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p27.
482 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p76.

would give autonomy to 13 regional CONAGUA offices.[483] The reform would delegate water management into the hands of local governments and users. The law specified that CONAGUA offices would be subordinated to the local watershed authorities. The only catch: CONAGUA never published the regulations regarding implementation of the 2004 water law.[484]

Meanwhile, at least in Chiapas and Jalisco, locally contested water concessions were given at low or no cost to the bottled water industry. Coca-Cola's right to extract unlimited water from indigenous sources in Chiapas spawned protests and media attention.[485] "In the 2000s, for example, the Mexican government proved particularly willing to grant Coke attractive tax breaks as it looked to expand in the interior of the country … [In Chiapas] Fox oversaw a permit that allowed a Coca-Cola bottler to extract at virtually no cost."[486]

In 2003, Carlos Ahumada, the director of the newspaper El Diario Independiente, published a series of articles alleging water concessions had been inappropriately given to Fox's campaign supporters, "Los Amigos," some of them Coca-Cola executives.[487] The articles alleged that Fox granted concessions to extract unlimited quantities of the

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483 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3: p.408.

484 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3: p.408.

485 Nash, June, "Consuming Interests: Water, Rum and Coca-Cola from Ritual Propitiation to Corporate Expropriation in Highland Chiapas," *Cultural Anthropology,* Nov. 2007, v22, i2: p.631.

486 Nash, June, "Consuming Interests: Water, Rum and Coca-Cola from Ritual Propitiation to Corporate Expropriation in Highland Chiapas," *Cultural Anthropology,* Nov. 2007, v22, i2: p.631.

487 Castro Soto, Gustavo, "Agua y Economia: La Coca-Cola en Mexico el Agua Tiembla," Agua.org.mx, April 27, 2005.

nation's best groundwater.[488] Ahumada was imprisoned the following year on unrelated charges that elevated the scandal of alleged presidential wrongdoing.[489]

Meanwhile, behind "the explosive growth both of the bottled water market and the underground bottled water distribution was the simplification of the business registration during the Fox administration."[490] The process was streamlined and "instead of a long bureaucratic process, bottled water businesses only had to register on the internet to be legal."[491]

The number of bottled water distributors doubled during the Fox administration.[492] In 1985 there were 35 bottled water companies organized under the bottled water industry association, the Asociacion de Productores y Distribuidores de Agua Purificada (ANPDAPAC).[493] By 1998 there would be 3,500, registered with the federal government[494] and by 2006, 6,000.[495] ANPDAPAC reported that less than 1,000 were legitimate. Unregulated informal distributors were likely refilling brand-named bottles from unreliable sources, re-using bottles without the capability to properly clean them between uses, and unable to keep up with the maintenance of their own filters.[496] An official study conducted by the federal health agency found 15 percent of 22,616

488 Castro Soto, Gustavo, "Agua y Economia: La Coca-Cola en Mexico el Agua Tiembla," Agua.org.mx, April 27, 2005.
489 Castro Soto, Gustavo, "Agua y Economia: La Coca-Cola en Mexico el Agua Tiembla," Agua.org.mx, April 27, 2005.
490 Ramirez, Zacarias, "Empresas buscan fijar una norma para regular venta de agua embotellada," *Noticias Financieras,* Jan. 24, 2012.
491 Ramirez, Zacarias, "Empresas buscan fijar una norma para regular venta de agua embotellada," *Noticias Financieras,* Jan. 24, 2012.
492 Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.
493 Lara, Juan Antonio, "Logran sobrellevar crisis embotelladores de agua," *El Norte,* Aug. 5, 1996.
494 Rendon, Hector, "Encabezan 5 gigantes al sector," *Reforma,* Sept. 2, 1998.
495 Silvia, Olvera, "Inundan mercado aguas embotelladas," *El Norte,* Aug. 9, 2012.
496 Silvia, Olvera, "Informalidad: El enemigo a vencer," *El Norte,* Aug. 19, 2010.

samples of bottled water and ice made of purified water to be contaminated with fecal coliform.[497] Other studies have shown that contaminated bottled water continues to be sold in Mexico. One study of 265 samples from 39 different brands in Mexico City showed that only 13 of the brands met bacteriological parameters for public drinking water suppliers, as established in official Mexican standards (NOM-041-SSA1-1993).[498] (Mexican law does not require bottled water firms to document how their water meets Mexican drinking water standards.)

Partially because of the unreliability of the cheaper brands, Danone, Coke and Pepsi continued to expand. Some consumers report going directly to the Coca-Cola factory to ensure they were buying treated water.[499] Despite challenges, the bottled water industry prospered during the Fox administration. One report from the time stated the bottled water industry's "growth in sales has been 10 percent per year and the margins are calculated at 30 percent of the price to the consumer."[500] As a symbol of the growing prominence of the bottled water industry to the Mexican economy, in 2002 the Bank of Mexico began to incorporate the price of bottled water in the price index used to calculate inflation.[501]

At the end of FOX'S presidency, the Fourth World Forum on Water would be held in Mexico City in 2006. With the world's leading water experts and business

497 Gomez, Leslie, "Dificultan 'piratas' revision a hieleros," *Reforma,* June 2007.
498 Robles, Esperanza, Ramirez, Pedro, Gonzalez, M. Elena, Sainz, Ma. de Guadalupe, Martinez, Blanca, Duran, Angel, and Ma. Elena Martinez, "Bottled-water Quality in Metropolitan Mexico City," *Water, Air, and Soil Pollution,* Netherlands, 1999, v113.
499 Interview with CONAGUA officials, July 19, 2013.
500 Cruz, Antimio, "El consume purificado," *Reforma,* July 08, 2002.
501 Cruz, Antimio, "El consume purificado," *Reforma,* July 08, 2002.

groups were in attendance, Fox gave the keynote address calling the audience, "the ones who will best take care of our waters of tomorrow. … I extend my profound recognition to this international community that has kept their promise to open the road to a new era of justice and equity for those who care for water. … It is indispensible that from this group come the social and political leaders that passionately defend all of our planet's water."[502]

The World Bank would issue strong warnings at the end of the Fox administration about Mexico's private political capture.[503] "While the transition to democratic governance is underway in Mexico, a number of interest groups are mediating – and many times capturing – the relationship between the political leadership and the citizens in general (as voters), affecting the provision of public goods and services."[504]

FELIPE DE JESÚS CALDERÓN HINOJOSA (2006-2012)

Mexico's President Felipe Calderón continued Fox's decentralization with the 2004 National Water Law after he named a politician Jose Luis Luege-Tamargo to become the new head of CONAGUA. The appointment of a PAN politician with no background in water affairs as CONAGUA's Director General was a rupture with the

502 ANEAS, "Discurso del President Vicente Fox Quesada," *Agua y Saneamiento,* Asociation Nacional de Empresas de Agua y Saneamiento, June 2006, p32.
503 World Bank, *Democratic governance in Mexico: Beyond state capture and social polarization*," The International Bank for Reconstruction and Development, 2007.
504 World Bank, *Democratic governance in Mexico: Beyond state capture and social polarization*," The International Bank for Reconstruction and Development, 2007.

hydrocracy tradition.[505] CONAGUA's staff fell from a peak of 34,000 employees in 1989, to 14,000 in 2007.[506] By the end of Calderón's administration CONAGUA would have 13,000 staff members.[507] Philippus reports that the change is further reflected by the fact that political operators have remained at CONAGUA while "more qualified water professionals" have left.[508] These staffs change "implies a loss of power for the hydrocracy, the deterioration of [CONAGUA's] position within the government and the decline of importance of water on the political agenda.[509] Meanwhile bottled water continued to proliferate.

Under Calderón bottled water sales doubled again, from an estimated $5.1 billion to $10 billion.[510] The Mexican market grew to be number one globally in per capita consumption of bottled water and then in sales. As the overall market grew, competition to control it grew more serious. According to Euromonitor International, the higher profitability is in sales of the smaller unit size. The largest number of vendors sold large containers, garafons, while a smaller number of bigger players sold smaller bottles with

505 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2, n3: p409.

506 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3: p409.

507 Rea, Daniela, "Peña Nieto planea crear Secretaria del Agua," *Reforma,* Oct. 1, 2012.

508 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3: p409.

509 Wester, Philippus, Rap, Edwin, and Sergio Vargas-Velazquez, "The hydraulic mission and the Mexican hydrocracy: Regulating and reforming the flows of water and power," *Water Alternatives,* 2009, v2 n3: p409.

510 ANEAS, "Memorias XXVI: Queretaro 2012, convencion anual y expo ANEAS," Asociacion Nacional de Empresas de Agua y Saneamiento, 2013. "During the conference Ing. Jesus Higuera expounded on the problem of having contradictory laws that reduce the development of infrastructure for the extraction of water," the report notes, p22.

higher profits. As these companies increasingly achieve higher profits they buy up the competition.[511] President Calderón had little influence on the bottled water market. During his administration the industry grew and the most profitable bottled water producers focused on smaller bottles.

PRESIDENT ENRIQUE PEÑA NIETO (2012-)

While it remains to be seen how President Enrique Peña Nieto will deal with the provision of safe drinking water for Mexico's citizens, he has signaled a continuation of the commodification path. Even before taking seat as president, Nieto appointed David Korenfeld to his transition team as a "water coordinator." Korenfeld had previously worked as the director of the bottled water industry association, ANEAS. As president, Nieto appointed Korenfeld director of CONAGUA.[512] Further signaling the change, Korenfeld is now referred to in Mexican media as CONAGUA's Chief Executive Officer.[513]

In 2012, the Nieto administration and Korenfeld announced their intention to create a Secretaria del Agua.[514] This would remove CONAGUA from the environmental agency where it now resides and once again return the administration of the nation's water to center stage. They have further signaled plans for a new national water institute,

511 Euromonitor International, "Bottled Water in Mexico," *Country Report,* Euromonitor International, March 2013.
512 Leon, Mariana, "David Korenfeld, nuevo director de CONAGUA," *El Universal,* Dec. 4, 2012.
513 Notimex, "Pena Nieto to open works in Guerreo," *Notimex,* April 4, 2014.
514 Rea, Daniela, "Peña Nieto planea crear Secretaria del Agua," *Reforma,* Oct. 1, 2012.

to include the study of the economics of water which the current national water institute is not charged to do.[515] Nieto has acknowledged that while both of these changes are priorities, the reality of implementing them would involve a lengthy political process and as such, any description of the impact they would make is speculative.[516]

515 Rea, Daniela, "Peña Nieto planea crear Secretaria del Agua," *Reforma,* Oct. 1, 2012.
516 Rea, Daniela, "Peña Nieto planea crear Secretaria del Agua," *Reforma,* Oct. 1, 2012.

CHAPTER 6: CONCLUSION

This study has shown that a combination of factors in Mexico has facilitated bottled water as the preferred choice for potable water. Mexico's per capita consumption of bottled water is the highest in the world and recent surveys show the consumption is much higher than previously estimated.[517] Mexico illustrates how a private industry selling bottled water can profitably provide water in cases where capital intensive investments are unlikely because of social and economic factors. By avoiding the infrastructure expense of costly transmission and distribution systems, Mexico's bottled water industry is able to forgo 85 percent of the costs typically incurred in the provision of drinking water.[518]

The rise of the bottled water industry in Mexico reflects Mexico's history. Mexican consumers have lost faith in the safety of the water distribution system. A combination of an earthquake, a cholera epidemic, multiple financial crises, advertising, political capture, and personal experience are all factors in Mexicans' distrust in the water that is piped into their homes. While Mexicans collectively pay many times the unit-price for water, they choose to do this because of the lack of faith in their public water systems. In lower-income areas the portion of disposable household income spent on bottled water often far exceeds the 3-5 percent benchmark of affordability

517 IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.
518 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p27.

recommended by the international financial institutions.[519] Ironically, the bottled water they consume is often contaminated.[520] Furthermore, as a society, even when investments to improve the public water system are made consumers continue to prefer brand name water. In January 2014, Mexico City passed an ordinance requiring restaurants to serve tap water to customers but early reports suggest that customers have refused to comply.[521] "The majority of customers prefer bottled water," the president of Mexico's restaurant chamber stated.[522] Evidence suggests that restoring faith in the public system may be difficult. Once the bottled water industry becomes established it may be entrenched; as noted above, "After having seen yellow water, brown water, people just don't want to take the risk."[523]

The bottled water industry was able to find a market solution to the Mexican government's failure to maintain, repair and adequately expand the nation's drinking water system. Mexico's bottled water industry may become a model for other nations with similar barriers to access safe water. As a collective choice it is an expensive model and without regulations and oversight. There are no regulations to guarantee that the water delivered through this model is safer. In order for consumers to determine if the choice they make is reasonable, mechanisms need to be in place to ensure that the public

519 OECD, *Managing Water for All: An OECD Perspective on Pricing and Financing,* OECD, 2009: p57.

520 Gutierrez, Rey, Vega, Salvador, Ortiz, Rutilloa and Beatriz Schettino, "Presence of organochlorine contaminants in bottled drinking water from Mexico City," *Water Science and Technology: Water Supply,* 2012, v12, n4; Fox News, "More than 24,500 chemicals found in bottled water," Fox News, Jan. 13, 2014; Sukhija, Sheetal, "Beware of contaminated bottled water," IBN News, Mar. 19, 2012, accessed at http://ibnlive.in.com/news/beware-of-contaminated-bottled-water/240233-60-119.html.

521 Licon, Adriana Gomez, "Drink the Water," *Associated Press,* Jan. 24, 2014.

522 Licon, Adriana Gomez, "Drink the Water," *Associated Press,* Jan. 24, 2014.

523 Malkin, Elizabeth, "Bottled-Water Habit Keeps Tight Grip on Mexicans," *The New York Times,* July 16, 2012.

has access to information about the quality of both tap water and bottled water quality. The choice to consume bottled water may be a personal choice, but as a society Mexicans are choosing to spend thousands of times more than if they invested in a centralized water system that provided safe and reliable water.

This study was undertaken with the intent document factors that allowed the bottled water industry in Mexico to become the largest in the world. While this study has achieved its intent, there remain a number of important questions. If Mexico's bottled water industry offers a model of water provision in an era of scarcity, what are the implications? Will increased consumption of bottled water result in even less willingness to pay for water and waste water infrastructure in developing nations? Can the bottled water industry thrive or even survive in a context where public water infrastructure is continuously improving or where ambient water quality in the environment is being restored? How will the bottled industry respond to different circumstances around the world? The bottled water industry and privatization advocates insist that there will be measures to ensure access by the poor to a minimum level of services, even if they can not pay for better water, however, are there bottled water industry responsibilities towards Mexico's poor? How will those assurances occur and how will they be subsidized, by whom, and with what resources?

Can public water services learn anything from the several decades of development of the bottled water industry? What lessons are there about consumer preferences and fears? Given the circumstances, public water works can provide water at $1/1000^{th}$ of the cost, yet they are losing customers! Is it possible for a public water sector

to provide the level of service and confidence that bottled water companies provide? It would be useful to compare the bottled water industry's strategies in regions where functioning water utilities reliably provide high quality drinking water. How would consumer preferences stack up between Mexican's who only drink bottled water, against consumer preferences in nations with the most advanced, expensive, centralized water systems?

Appendix 1: Mexico's Bottled Water Industry By the Numbers.

The bottled water market in Mexico differs significantly from the bottled water market in the United States (see Table 3).[524] The biggest difference is how the water is sold. In Mexico and throughout Latin America, the majority of sales (70 percent) are delivered to the home in 19 or 20 liter containers called garafons.

Table 3: Latin America Bottled Water Market by Volume

	Single Use Containers	Bulk Size/ Garafons
Mexico	30%	70%
United States	88%	12%

Source: Zenith International Ltd, 2006, International Bottled Water Association

Another significant difference is that in Mexico there is a lack of trust in the public tap water delivery system. In a survey carried out by the Inter-American Development Bank (IDB) in 2010 in Mexico, only 19 percent of respondents reported consuming tap water (see Table 4). Of those who do not drink tap water, 81 percent drink bottled water (see Table 5). This estimate implies that 66 percent of Mexicans use bottled water. Of Mexico's 2013 estimated population of 118 million this is equal 76.7 million bottled water consumers in Mexico who report they use bottled water for their daily drinking water. Eleven percent, or 13 million consumers bath their children in bottled water.

524 All results discussed in this appendix come from: IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

Table 4: IDB Mexican bottled water consumption survey: how do you use tap water?

Do you use water "straight from the tap" to …		
	Yes	**No**
Bathe yourself	98%	2%
Wash dishes	96%	4%
Bathe infants	89%	11%
Brush teeth	84%	16%
Wash fruits/veggies	76%	24%
Cook	54%	46%
Drink	19%	81%

Source: *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011

Table 5: IDB Mexican bottled water consumption survey: How do you obtain drinking water?

If you don't drink tap how do you obtain drinking water?	
Response	**Survey Says**
Buy bottled water	81%
Boil it	7%
Disinfect it	2%
Filter it	8%
No response	2%

Source: *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011

There is significant regional variation in the survey (see Tables 6 and 7). The few regions in Mexico with reputable water systems report lower bottled water usage. In Monterrey for example, while 90 percent report believing tap water is safe (see Table 6), 60 percent report drinking it (see Table 7). While in Monterrey, 100 percent of the people surveyed reported using tap water for cooking in other regions close to 75 percent of the surveyed population reports not using it to cook with. In Tampico 29 percent reported that they do not even bath their babies with tap water!

Table 6: IDB Mexican bottled water consumption survey: Is tap water safe to drink?

Do you think tap water is safe to drink?		
Location	**Yes**	**No**
Queretara	51	49
Mexico City	37	62
Tampico	26	73
Chihuahua	82	17
Monterrey	90	10
Guadalajara	12	87
Xalapa	19	81
Villahermosa	8	92
Tuxtla Gutierrez	18	82

Source: *Latin America's Other Water Infrastructure*, Inter-American Development Bank, Nov. 10, 2011

Table 7: IDB survey: Tap water consumption by region

Do you use the tap water to drink?		
Location	**Yes**	**No**
Queretara	14	86
Mexico City	17	83
Monterrey	60	40
Tampico	5	95
Chihuahua	50	50
Guadalajara	1	99
Xalapa	1	99
Villahermosa	0	100
Tuxtla Gutierrez	2	98
Total	19	81

Source: *Reporte Grafico Ejecutivo,* report from Estudio sobre Agua Embotellada en Mexico, Inter-American Development Bank, Feb. 2010.

The difference between Table 6, "do you think tap water is safe?," and Table 7 "do you use tap water to drink?" is significant. In the same survey, 37 percent of people in Mexico City report that tap water is safe, while only 17 percent report drinking it. In Guadalajara, 12 percent believe it is safe but only 1 percent drink it. Even in Chihuahua where 82 percent of the respondents report believing it is safe, only 50 percent drink it.

Table 4 shows that nationwide 11 percent report not using tap water to bathe their babies, an estimated 24 percent do not use tap water to wash fruits and vegetables, and 46 percent do not use it for cooking. Showing the variation by region, in Monterrey

only 3 percent do not use the tap water to wash their fruits and vegetables while in Villahermosa that figure is 40 percent. Of those who purchase bottled water, 100 percent use it for drinking, 49 percent use it for cooking, 18 percent use if to brush their teeth and 11 percent use it to bathe babies (see Table 4).

Table 8: IDB Mexican bottled water consumption survey: Average expenditures

Average monthly water expenditures (USD)		
Location	**Bottled water**	**Water and Sanitation Service Bill**
Queretara	$8	$21
Mexico City	$10	$4
Tampico	$9	$20
Chihuahua	$6	$27
Monterrey	$6	$13
Guadalajara	$12	$18
Xalapa	$11	$22
Villahermosa	$15	$3
Tuxtla Gutierrez	$14	$15
Average	$11	$17

Source: *Latin America's Other Water Infrastructure*, Inter-American Development Bank, Nov. 10, 2011

When it comes to household spending on bottled water the responses varied by region (see Table 8). Respondents from Mexico City reported only spending $4 per month on water and sanitation provided by the water utility, while spending $10 per

month on bottled water. By comparing Table 8 and Table 6, the relationship between low quality tap water and low monthly payments is obvious. In Chihuahua water bills paid to the utility are much higher, $27 per month, but consumer confidence in the safety of the tap water is 82 percent. Mexico City residents pay very little for what is perceived to be low quality tap water while residents in Chihuahua pay much more for higher quality service. Villahermosa respondents reported only spending $3 per month on tap water and sanitation services, while 92% reported believing their water is not safe. Monterrey is the exception to the rule as residents there report spending only $13 per month on tap water and sanitation services while 90 percent believe it is safe to drink. Regions that report paying the most for tap water also report having the least faith in their tap water.

Table 9: IDB Mexican bottled water consumption survey: Garafons per week.

Numbers of garafons per week	
1 to 4	**38%**
5 to 8	34%
9 to 12	15%
13+	13%

Source: *Latin America's Other Water Infrastructure*, Inter-American Development Bank, Nov. 10, 2011

The average price paid for a garafon was $19 pesos with a range of 4 pesos to more than 30 pesos per garafon. Nationally, the average household purchased 5.77 garafons per month. Spending averaged $132 pesos ($10 USD) per month or $1584

pesos ($120 USD) per year, which when multiplied by the population of 118 million represents an estimated industry with $14 billion revenues in 2010.

Thirty-eight percent reported purchasing 1 to 4 garafons per week and 34 percent purchased 5 to 8 garafons per week while 15 percent purchased 9 to 12 garfons per week and 13 percent purchased more than 13 (see Table 9). When asked about consumption of bottled water habits an average of 80 percent reported having purchased bottled water in the past four weeks. All of the respondents in Villahermosa and 90 percent or more in Guadalajara, Tuxtla, Xalapa and Tampico report purchasing bottled water in the past four weeks. Only 30 percent in Chihuahua and 55 percent in Monterrey report the same. Of those who reported purchasing bottled water, 78 percent purchased the bulk sized 19L garafons and 18 percent reported purchasing both garafons and smaller bottles of water.

This study describes Mexico with a larger bottled water consumption than previously estimated. The national per capita monthly consumption is 40L. The average consumption level, according to this IDB study is 154 L per month, (1848 L per year). The study's final report states that the range of consumption was 228L to 840L per capita per year. While this study should be redone to confirm these results, the findings suggest that Mexico's bottled water industry is at least twice the size previously estimated. Other published reports show that Mexico's bottled water consumption was 234 l per person in 2010 while this study shows that it is closer to 480 (see Appendix 2 for a discussion on survey methodology).

The survey shows mixed results about how people have learned that their water is contaminated and how they've learned that bottled water is safe. Television, radio, official bulletins, advice from their doctors and communication with their neighbors and family all play equal roles. About 60 percent believe that the water contamination comes from the delivery system between the treatment plant and their home water tank. Another 19 percent believe that contamination occurs at the treatment plant and 17 percent believe it gets contaminated at the home. Only 12 percent report that they or a family member have had diarrheal sickness attributed to drinking tap water. A quarter of the population report having heard public information campaigns stating that the tap water is of good quality while an equal number report having heard or read information about the risks of drinking tap water. More than half (54 percent) have heard or seen news or publicity touting the advantages of bottled water. The primary response people gave as to why they do not use tap water was that it is filthy (37 percent). Another 28 percent report they do not have confidence in its quality.

The same survey looked at civic trust in distinct levels of government service provision and respondents reported a general lack of trust in all levels of government. On a scale of 1 to 10, local and state governments averaged a ranking of 5 and the federal government a 6. The results varied by region with only 18 percent in Monterrey scoring the federal government poorly while 80 percent did in Tuxtla Gutierrez. Only 4 percent of respondents in Mexico City ranked their municipal government as favorable (as measured by giving the government, on a scale of 10, a 9 or 10 out of 10). On average, more than 77 percent ranked their government as unsatisfactory.

This study commissioned by the IDB reports the penetration of Mexico's bottled water industry through a survey carried out in 9 cities with a 1305 responses.[525] The IDB commissioned a study to be conducted among the households that already have connections to the tap water system. The survey results were presented at the IDB headquarters in Washington D.C. at a conference titled "How Mexico Became the World's Top Consumer of Bottled Water," on Nov. 10, 2011. The bank reports: "The survey indicates that the consumption of bulk bottled water (in 20 liter containers) is far higher than previously estimated."

[525] IDB, *Latin America's Other Water Infrastructure,* Inter-American Development Bank, Nov. 10, 2011.

Appendix 2: Global Bottled Water Snapshot

Table 10: Global bottled water consumption by top countries 2000-2010,

DATA TABLE 19 Per-Capita Bottled Water Consumption by Top Countries, 1999–2010 (liters per person per year)

Countries	1999	2000	2001	2002	2003	2004	2005 (BMC)	2007 (BMC)	2009 (Canadean)	2010 (BMC)
Mexico	117	124	130	143	157	169	179	205		243
Italy	155	160	164	167	179	184	191	202	189	187
United Arab Emirates	110	114	119	133	145	164	181	260		153
Belgium-Luxembourg	122	118	118	124	133	148	160	150	120	148
Germany	101	102	103	105	121	125	128	126	165	134
France	118	126	131	141	148	142	139	136	112	132
Spain	102	105	109	112	127	137	146	120	124	124
Lebanon	68	77	85	94	96	102	107	111		121
Thailand	67	70	73	76	77	77	77	89		114
Hungary	30	39	46	51	62	66	70	108	109	111
Switzerland	90	90	90	92	96	100	104	107		108
United States	64	67	74	82	85	91	99	111		107
Slovenia	48	56	64	71	78	80	81	95	56	107
Croatia	42	47	52	56	62	69	78	92		101
Cyprus	67	72	76	81	86	92	98	91		98
Qatar							81			95
Saudi Arabia	76	80	85	90	88	88	93	91		95
China/							69			95

Source: Gleick, Peter, *The World's Water Volume 7*, The Pacific Institute, 2011, p.340.

Table 10 shows that Mexico is the world's top bottled water consumer. Other per capita bottled water leaders such as Italy, United Arab Emirates, and Germany have fallen in consumption while Mexico's has continued to grow. These numbers differ significantly

from the IDB survey (see Appendix 1) which show Mexico's per capita consumption to be 480 liters per person per year. The difference can at least in part be explained by the IDB survey method of measuring consumption at the household level and the previous estimate by the International Bottled Water Association (IBWA) which measured reported sales. While more data needs to be gather to access the accuracy of the IDB survey, it appears a household survey is gathering data that the IBWA missed. This can be in part explained by the fact that in Mexico, a large but unknown portion of the bottled water industry is unaccounted for.[526]

[526] Barrientos, Alberto, "Buscan Agua Purificado," *Reforma*, March 22, 2007.

Appendix 3: Nestlé.

Nestlé a Swiss company, is among the largest corporations in the world.[527] It became famous in the Second World War because of their instant coffee Nescafe. As they grew they steadily incorporated products and brands, becoming one of the most prominent names in processed food on the planet. In 1985 they made the biggest merger up to that time "outside the oil industry" by buying up Carnation.[528] In 1990, they joined up with General Mills. In the early 1990s they looked into the future and began acquiring water bottled water companies.

Nestlé's history claims that their founder sold bottled water in 1843.[529] However, it was not until 1992, with the purchase of The Perrier Group that Nestlé entered the market on a global scale. Perrier had acquired a number of smaller, cheaper brands of bottled water in the 1980s, so after the Nestlé purchase they all became the world's largest bottled water company.

Perrier was a French water that became a status symbol in the 1980s. "Thanks to the marketing efforts of Nestlé Waters North America Inc, social drinkers started ordering Perrier instead of a cocktail or soft drink," the website *Fine Bottled Waters* states. In 1980, Perrier sold 12 million bottles and by 1990 they sold 152 million.[530] "When you held a Perrier bottled up, it said something about yourself, it

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527 "Reinventing Nestlé," *Investors Chronicle*, July 11, 2013.
528 "Reinventing Nestlé," *Investors Chronicle*, July 11, 2013.
529 Nestlé Waters, *Nestlé Water's Brandbook*, 2012.
530 Forsyth, Hamo, *Bottled water has become liquid gold*, BBC Business, Nov. 22, 2010.

said you were sophisticated, you … understood what was happening in the world," Beverage Marketing Corporation Chairman Michael Bellas explained.[531] News articles from the period describe high demand for Perrier and others such as San Pellegrino at restaurants and bars.[532]

While bottled water was still a niche market, Nestlé was looking to continue expanding into the future. In 1998 Nestlé introduced Nestlé Pure Life, and in 2000 it was launched in Pakistan, Brazil, Argentina, Thailand, and Mexico. [533]In 2002 the Perrier Vittel group changed its name to Nestlé Waters. Nestlé CEO Peter Brabeck-Letmathe became a famous voice for the bottled water industry. He argued for allowing markets to allocate prices to preserve resources. Brabeck-Letmathe stated openly that "human beings do not have a right to water." Water should be treated like a foodstuff, "so that we're all aware that it has its price."[534] He also stated that steps should be taken for the part of the population without access to water. In 2009, Brabeck-Letmathe wrote in *Foreign Policy* magazine: "Water is the new gold, and some countries and companies are already banking on it." In 2010 he wrote in the Guardian that while everyone was paying attention to oil water just became the real issue: "unless radical changes are made, we will run ot of water first, and

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531 As quoted in: Forsyth, Hamo, *Bottled water has become liquid gold*, BBC Business, Nov. 22, 2010.

532 James, George, "Perrier recalls its water in U.S. after benzene is found in bottles," *The New York Times,* Feb. 10, 1990.

533 Shiller, Robert "Marketing Strategy of Nestlé Pure Life," April 2004.

534 *We Feed The World,* documentary, 2005.

soon." By 2013 water would account for about 10 percent of Nestlé's total sales and they would be the dominant global player in one of the emerging market of water.

In the U.S., as in the world, Nestlé is the number one selling bottled water company.[535] According to Fortune 500's 2013 listing of the world's largest corporations by sales volume, Nestlé was the 69th biggest corporation in the world with $98b USD in sales and $11.5b in profits.[536] Because of their massive capital investments Forbes considers Nestlé to be the world's 39th most valuable brand and eleventh in Forbes's 2013 rank by market value.

Despite Nestlé Water's stance on the global stage, they only control a small share of the Mexican water market.[537] Mexico is Nestlé's sixth biggest market and Mexico accounts for about 3.5 percent of Nestlé's total sales (including all products). Globally, bottled water accounts for $8b of Nestlé's $98b per year in sales. Exact numbers are not specified in Nestlé's annual report, and they did not respond to requests for information. If Mexico can be seen as representative of Nestlé's global market, one estimate of Nestlé's sales in 2013 is about $300 million.

Nestlé has plans to continue to invest in Mexico but it is unclear how this investment will affect the bottled water market. In Jan. 2014 they announced a $1b

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535 Nestlé controls about 27% of the US bottled water market, according to Nestlé Waters.

536 MoneyCNNFortune, *Fortune 500 2013*, May 20, 2013.

537 According to a Nestlé press release from 2006, while they controlled less than 10% of Mexico's water market, in that same year they also controlled 15% of Mexico's entire domestic trade. Grupo Modelo S.A. "Press Release: Grupo Modelo signs letter of intent," Nov. 29, 2006. Accessed Jan. 30, 2014: http://www.gmodelo.mx/repository/eventos/eng1299871786278.pdf

investment plan to invest in Mexico, but the announcement revealed a plan to build a new dog food and baby food factory.

Nestlé is accustomed to selling a product and altering the very context of the world through that product's use. Instant coffee, invented in the 1930s became a staple for troops during WWII. "In the 1990s, Nestlé turned itself into the world's biggest supplier of bottled water via the acquisitions of Perrier and San Pellegrino.[538]Today Nestlé markets "itself as a 'Nutrition, Health and Wellness company,"[539]

In the 1990s Nestlé leaders made a push to locate Nestlé "towards 'functional' foods, foods that had some sort of health benefit, whose sales were growing much faster than standard processed foods." Like Danone they make their money selling dozens of products other than water. Water is just one holding along with baby food. Recently Nestlé has invested in the baby food business. Reports tout that global baby-food sales, a $30bn-plus-market—are growing by 10 percent a year.[540] Water reports tout that the bottled water market, home filtration market and water treatment technology sectors will grow at an equal or higher rate in the next 10-15 years.[541] In Mexico, Nestlé has combined the baby food and water market with their bottled water specially formulated for babies, Gerber water.

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538 Bottled Life, *Nestle and Water*, web-page, Bottled Life Film, 2012, accessed at: http://www.bottledlifefilm.com/index.php/nestle-and-water.html

539 Investor's Chronicle, "Reinventing Nestlé," *Investors Chronicle,* July 11, 2013.

540 Investor's Chronicle, "Reinventing Nestlé," *Investors Chronicle,* July 11, 2013.

541 Bank of America, *The Global Water Sector*, Bank of America and Merrill Lynch, Sept. 28, 2011, p33.

Worldwide Nestlé Waters "the healthy hydration company," has 64 brands: seven named after saints. In the US they sell 14 brands.[542] In Mexico they sell three, Nestlé Pureza Vital, Santa Maria, and Gerber, "the water specially developed for babies."[543]

542 Nestlé Waters, *Nestlé Water's Brandbook,* 2012. The US and Canada make up Nestlé Waters North America's distribution and sells the following brands: Acqua Panna, Arrowhead, Deer Park, Ice Mountain, Nestea, Nestlé Pure Life, Ozarka, Perrier, Poland Spring, Resource, S. Pellegrino, Sweet Leaf Ice Teas, Tradewinds, Zephyrhills.

543 Nestlé Waters, *Nestlé Water's Brandbook*, 2012

Appendix 4: Price comparison: Bottled Water vs. Tap Water

Bottled water as a solution for societal drinking water is a more costly proposition than a public or private water managed and delivered through a centralized system. Bottled water is sold at approximately tens to thousands of times the price of treated potable tap water (See Table 12). According to Global Water Intelligence Aarhus, Denmark currently has the world's most expensive tap water (see Table 11). Denmark paid $4.32 per m^3 while India was the lowest paying $0.15 per m^3. There are also exotic waters with prices in the tens and hundreds of dollars per liter. To calculate a fair range of price comparisons one approach is to use the most expensive (common) bottled water as represented by the bottled water sold in US and Mexican airport: Starbucks at $4 per liter.[544] This can be compared to the cheapest commercially available waters in Mexico which are sold in 19L garafons for $2 or about $0.095 per liter.

[544] According to Said, Sammy, "The Top 10 Most Exotic and Expensive Bottled Waters in the World," *The Richest,* Jan. 2013, http://www.therichest.com, the most expensive bottled water Acqua de Cristallo Tributo a Modigliani (infused with gold flakes) in the world is $60,000 per 750ml which makes it 13.9 million times as expensive as Danish tap water, and 500 million times more expensive than tap water in India. A more common but still extreme example would be Bling H20 at $40 per 750 ml which is 12,345 times as expensive as Danish tap water and 353,333 times as expensive as tap water from India.

Table 11: Average tariffs and water usage in selected countries

Average tariffs ($/m^3) and water usage in selected major countries

Country	Combined tariff	Water tariff	Wastewater tariff	Change %	Domestic use l/head/day	No. of cities
Denmark	$8.83	$4.32	$4.52	0.1%	114	2
Australia	$5.78	$3.14	$2.65	11.5%	605	5
Germany	$5.36	$3.33	$2.02	1.8%	151	10
France	$4.56	$3.24	$1.31	-0.6%	232	7
United Kingdom	$4.27	$2.07	$2.19	3.9%	139	8
Czech Republic	$3.63	$1.86	$1.78	5.7%	213	3
Canada	$3.14	$1.95	$1.19	7.5%	778	5
Poland	$3.12	$1.44	$1.68	17.8%	149	6
United States	$2.98	$1.29	$1.69	8.1%	616	27
Japan	$2.56	$1.48	$1.08	0.2%	373	13
Portugal	$2.27	$1.62	$0.65	0.6%	308	3
Spain	$2.13	$1.47	$0.66	1.9%	342	6
Turkey	$2.14	$1.38	$0.76	10.5%	238	8
Italy	$1.81	$0.94	$0.87	11.6%	483	6
Russia	$1.00	$0.61	$0.39	21.9%	368	13
South Korea	$0.76	$0.56	$0.20	0.2%	552	7
Mexico	$0.69	$0.65	$0.04	2.8%	200	11
China	$0.46	$0.34	$0.12	5.7%	95	25
India	$0.15	$0.14	$0.01	1.8%	139	17

Source: Global Water Intelligence, 2014

A ratio of prices can be established by dividing the price of bottled water by the price of tap water and converting to common units of one liter (see Table 12). A range of these prices can then be established by comparing the price of the most expensive bottled water to the cheapest tap water and the most expensive tap water to the cheapest bottled water. In this case to find the ranges of prices:

Figure 1: Ratio of the most expensive bottled water to the cheapest tap water

$$\frac{P_{\text{bottle max}}}{P_{\text{tap min}} / 1000\text{l}} = \text{the upper bound of price difference}$$

$$= 4 \div (.15 \div 1000)$$

$$= 26{,}667$$

Figure 2: Ratio of the cheapest bottled water to the most expensive tap water

$$\frac{P_{\text{bottle min}}}{P_{\text{tap max}} / 1000\text{l}} = \text{the lower bound of price difference}$$

$$= \$0.095 \div (\$4.32 \div 1000)$$

$$\approx 22$$

Using the global range of prices established above, Starbucks bottled water purchased in Sept. 2013 in Guadalajara is 26,667 times as expensive as the world's cheapest tap water in India while the cheapest bottled water in Mexico is still 22 times as expensive as the most expensive tap water in the world. While this comparison is categorical it would be useful to examine real ranges within Mexico to see how much more Mexicans are spending on bottled water than on tap. Using the same formula for establishing price ratios, the $4 per liter of water at the

airport is roughly 6,153 times as expensive as tap water in Mexico ($0.65/m^3); 3,101 times as expensive as tap water in the US ($1.29/m^3) and 926 times as expensive as the tap water in Denmark. In Mexico the more common purchase of bottled water in larger garafons at $2 per 19L is still 666 times as expensive as tap water in India; and 138 times as expensive as tap water in Mexico.

The $2.79 for a liter price for bottled water in the US at a convenience store in January 2014 was 2,163 times the price of tap water in the US; 4,292 times the price of tap water in Mexico and 18,600 times the price of tap water in India.

As shown in Table 12, even the cheapest bottled water sold in large 19L containers in Mexico is still a 101 times as expensive as a tap water system. The larger brands sell garafons for $2 to $3 and while there is no guarantee that they are safe, as the price goes down, the likelihood goes up that the bottled water is nothing more than packaged tap water. The situation as shown in Table 12, is that Mexicans can spend several hundred times as much on bottled water delivered to their homes by a "reputable" corporation and their representatives, or they can spend 100 times as much on water that may be as risky as the tap water they are avoiding. Ironically, if water rates in India or Mexico doubled or tripled, their tap water systems could become solvent, expand and gradually improve their services yet because citizens object to even small rate hikes they end up paying 100s if not 1000s of times more.

Table 12: Ratios of bottled water prices to centralized tap water systems.

(Centralized water prices on X axis/ bottled water prices on Y axis)

Bottled water to Tap water Price ratio	$4.32/ m^3 (Denmark)	$1.29/$m^3$ (USA)	$0.65/$m^3$ (Mexico)	$0.15/$m^3$ (India)
$4 /L	930	3,101	6,154	26,666.7
$2.79 /L Price in an Austin Gas station 1/15/2014	649	2,163	4,292	18,600
$2/L	462	1,550	3,076	13,334
$1 /l	231	775	1,538	6,667
Garafon				
$3.00 / 19L	36	122	229	10,526
$2.50 / 19L	30	102	202	877
$2.00 / 19L	22	81.6	162	701
$1.25 / 19L	15	51	101	438

Source: Water system prices provided by the International Bottled Water Association, 2014.

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Vita

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